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PRACTICAL GARDENING

FOR

Indian Amateurs,

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'To study culture, and with artful toil
To meliorate and tame the stubborn soil ;
To give dissimilar yet fruitful lands
The grain, the herb, the plant, that each demands
To cherish virtue in a humble state
And share the joys your bounty may create ;
To watch the matchless working of the Power
That shuts within its seed the future flower—
* * * * * * * * *
These, these are arts pursued without a crime,
That leaves no stain upon the wings of Time."

COWPER.

PREFACE.

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In no pursuit or vocation is the old adage of “ an ounce of practice being worth a pound of theory ” more applicable than in horticulture, and in dealing with the subject, my aim has been to give practical results rather than to propound new theories.

It may be said that we have already many good books on gardening in this country, and this is undoubtedly true ; some of these, however, are scarce, others expensive, and most of them are now more or less superseded by the rapid advance made in the pursuit during the past few years ; another drawback to many otherwise valuable works being of much practical utility to the amateur, is the fact, that often our most learned authors write, as it were, from a lofty pinnacle, giving forth their knowledge to the world emblazoned with every possible botanical term, when their meaning could frequently be much better expressed in plain English, overlooking, of course, the fact that the majority of their readers have not had the opportunity they had probably enjoyed, of continually feasting on the works of our most eminent botanical authorities without restraint. It has been my constant aim to avoid falling into the same error, and in this work I have endeavoured to be as concise and clear as possible, avoiding all abstruse or theoretical questions, which too frequently serve to confuse and dishearten those who seek only for the instruction that shall enable them to practise. To be really useful to all classes of readers, has been the object throughout this volume, and every endeavour has been made to make it as plain as possible, presuming that it may fall into the hands of

many who have little or no knowledge of gardening in this country, and it is hoped that the directions given will be sufficiently intelligible to enable them to successfully prosecute their object, and at the same time prove instructive and useful to those further advanced in the art, I must, however, candidly confess that in the following pages there will be found but little to amuse the mysterious individual who prides himself on being recognised as "the general reader," but there is much I hope that will encourage and assist the amateur in his delightful occupation.

The greatest difficulty that has presented itself to me in giving the directions for culture and operations generally, has been the dates ; in a country having such an area and diversity of temperature, with a rainfall ranging from 5 inches in Sind to upwards of 500 inches in certain districts in Assam and Cachar, it would be utterly impossible to lay down any hard and fast rules on this point ; no book yet written or that ever can be written, will save the amateur from the necessity of exercising his own judgment, so as to adapt his garden operations not only to the climate but also to the weather and the state of the soil. The number of varieties of Vegetables and Flowers described herein is but small compared with those that are known, or the seeds of which are offered for sale. I have given only such as I have found from personal experience to be best adapted to the peculiarities of this country. Those who require a more extended list are referred to the Seed Catalogues.



THE GARDEN.

Its Arrangement and Management

“Strength may wield the ponderous spade,
May turn the clod and wheel the compost home,
But elegance, chief grace, the garden shows,
And most attractive is the fair result
Of thought, the creature of a polished mind.”

Cooper.

THERE is certainly no occupation or pursuit in which to obtain satisfactory results, a thorough knowledge of the subject is more necessary, than in Gardening. We should not only be acquainted with the variableness of climate and its influence on vegetation; the composition and ingredients of the soils at our disposal, but also of the natural functions of the organs of plants, the chemical properties or substances that constitute their food, and the way in which this food is absorbed, before we can understand the principles by which their growth is regulated; and yet, in practice, we pay but comparatively little heed to these matters, owing, of course, to the fact that we have taken advantage of the experience handed down to us by our predecessors, and have utilised their successes as an unfailing guide to ensure our own, by adopting their methods in our treatment of the same subjects. The botanist and physiologist have also had their experience handed down in the same way, and this has been augmented by their own observation and research. Botanical knowledge and discoveries are, however, almost invariably locked up in scientific treatises, which are of but little service to the practical gardener, who, too, frequently, can only imperfectly appreciate the importance

of the labours of the physiologist. On the other hand, the latter is but rarely well informed on much the gardener knows regarding the growth and development of plants, and generally works with the greatest indifference as to any practical result that may attend his labours, and yet it must be admitted that the most important discoveries regarding plant life have, as a rule, been made by those who study and work for the sake of knowledge only.

It is not, however, my intention to dwell on the scientific side of this subject, for there are but probably few amateur gardeners, who can give the time necessary to study horticulture theoretically. The question might be asked, if there is such a thing as theoretical horticulture at all, and the majority of gardeners would answer decidedly "No"! For if we would treat the subject in this way, we should have to travel so near the botanical gulf that we must inevitably be drawn into the vortex.

That beauty, like truth, is many-sided, is nowhere more evident than in a garden; where one man will call a thing hideous, the next beholder may consider it the *acme* of all that is beautiful, and yet each may be right from his own particular view of the question. These diverse opinions cannot, in most instances, be said to be merely the individual ideas of the man, but belong rather to one of two systems which, though frequently diametrically opposed to each other in practice, yet have the same end in view, namely, the securing of the most beautiful. These two systems may be briefly described as those of *art* and *nature*.

By speaking of art in a garden, I do not mean the labours of the true artist, or one who studies to give a true artistic effect in all that he undertakes, and in doing so is guided mainly by the beauties of nature, but rather the more formal work of the architect, who, but too frequently, ruthlessly sacrifices her chief adornments, to obtain what he considers an effect in conformity with the building it surrounds. In some instances this is carried almost as far as in the case of a well-known Scotch Earl, whose head gardener was a methodical old Scotchman with an eye for effect. In this garden there were two summer houses exactly resembling each other in dimensions and situation. In one of these, during his walks, the Earl observed a youth looking out of the window. On approaching the door his Lordship found it locked, and also perceived his gardener's son looking out of the window of the corresponding building, which was in like manner locked. "Why are those lads confined?" asked the Earl. "My Lord," replied the gardener, "I caught that rascal," pointing to the stranger "stealing the fruit." "But your own son! surely he is not a thief?" "Oh no!" replied the precise horticulturist, "Please your Lordship, I put *him* in for the sake of symmetry."

I do not wish it to be understood that we should entirely dispense with art in a garden, but it certainly should be made subservient to nature, for in the words of the immortal bard :—

“ This is an art
Which does mend nature : change it rather, but
The art itself is nature.”

How we can best follow nature in the arrangement and artificial cultivation of plants in this country is a subject on which there is naturally much diversity of opinion. When any one is successful in growing any particular plant or species from the cultivator's point of view and, as he probably imagines, by a course not exactly in accordance with that effected by the plant under natural conditions, a warning cry is raised that we must not follow nature's teachings too closely. On the other hand, another cultivator may succeed with the same plant or species by carefully following nature in every detail, and we are then perhaps told that we dare not disregard her laws with impunity. There are other would-be authorities again who are being continually buffeted about between these two extremes, advocating either one view or the other just as success or failure attend their various experiments.

The careful student of nature must first consider the means through which she accomplishes her ends. These are a genial soil, light, air, heat, moisture and last, but not least, a favourable situation ; and in endeavouring to follow her precepts, we must draw our lessons from the best examples she furnishes us and not the worst, for we know how variable are her productions. A plant or tree grown in a suitable position, genial soil, and where it is fully exposed to light, air and other essentials to its proper development is a very different object from the same species grown in a place where it is crowded or choked up amongst others, probably of stronger growth, and where, consequently, it has to maintain a continuous struggle even for its existence. Those who tell us not to imitate nature, err probably in misinterpreting her meaning, and are perhaps, unknowingly to themselves, all the time following her teachings in their daily practice.

And in no department of the gardener's multifarious duties is it so necessary to follow or imitate nature as in that of laying out and planting a garden. A few years since, when the bedding out system first came into vogue in England, the majority of gardeners rushed madly after the new idea, and nothing would please them but the most glaring arrangements of colour and the most rigid geometrical designs, and to satisfy this craze hundreds of grand old gardens were sacrificed to make room for it. To such an extent was this artistic mania carried, that one would continually hear of Grecian, Gothic, Elizabethan and other styles of garden designs, each intended, of course, for the particular form of archi-

tecture; happily, however, this is numbered with the things of the past, and it is now seen that liberties may be taken with the style of the building and its surroundings, without impairing the general effect. Formality is fast losing its hold as a recognised necessity in such cases, and nature steps in and asserts her right to be treated with becoming consideration.

The thorough knowledge, not only of the habits of plants, shrubs and trees, but also the innumerable aspects of vegetation which they present in nature, is to the gardener what the mastery of light, and shade, and drawing are to the artist before he can paint pictures of any value. A garden is for the keeping and bringing together of a number of beautiful things, and if we would utilise them as we ought, we must grow them in such a way, and under such conditions, that we may fairly see them as they would grow naturally, and placed in such positions that they may form one harmonious whole. Too frequently the character and natural growth of the plants are entirely sacrificed by crowding them together, under the mistaken idea that a more speedy or better effect is obtained. If we would display plants to the best advantage, let us give each one room to assert its own individuality, and not be crowded with others, so that its proper form is lost; by this means, in certain cases, we may possibly have longer to wait for a desired result but there is this compensating feature, that when once attained, its permanence is secured, for instead of a lot of sickly straggling plants, requiring constant nursing and attention, we shall have a strong healthy growth, abundant foliage and well ripened wood—in fact every essential quality to the formation of an object of beauty, also one that can withstand those vicissitudes of climate to which its weaker brethren so frequently succumb.



CHAPTER II.

Garden Designs.



“ Bless me ! what a delightful prospect is here ! and so it ought to be, for this garden was designed for pleasure—but for honest pleasure, the entertainment of the sight, the smell, and the refreshment of the very mind.”—*Erasmus*.

HOW many of our modern gardens are there which have been planned with the idea of carrying out the same principles as the one so favourably criticised by this famous Greek scholar centuries ago ? Too frequently such an idea as the garden forming a “refreshment of mind” or an “entertainment” of any of the senses is lost sight of or otherwise thrust aside, in our endeavours to follow some prevailing fashion, often entirely to the sacrifice of all that is beautiful. It must be admitted, however, that in our Indian gardens, the more general failing is the paying little or no attention to their arrangement or design. In most instances a tenant takes a house with a garden attached, which is looked upon as an indispensable appendage, or an undesirable addition to the expense of maintaining a suitable establishment, as the case may be. If of the latter opinion, for appearance sake he will probably spend just sufficient to keep it in a presentable condition. Should he, however, have a taste for horticultural pursuits, it may not only be well kept, but also well stocked with choice plants. In doing all this he will, in almost every case, rigidly adhere to the original plan of the garden, or grounds, no matter how inartistic or incongruous its design. Fearing almost as much to alter the form of any beds or walks, or remove any unsightly or overgrown trees or shrubs, as he would to alter the construction of the building itself, thereby probably binding himself to the old stereotyped designs of the builder or architect of the house, who in most instances knows

nothing of a garden or its requirements, nor even of its products, except those that are presented to him in an edible form.

It would certainly be impossible to lay down any hard and fast rule for the laying out of a garden, as there are so many points that must be taken into consideration, and in no two cases would all these points be precisely alike. First, we have the question of position ; this, however, in most instances, we must take as we find it ; then we come to the shape, formation, and extent of ground available. Its elevation must also be considered, so as to secure perfect surface drainage, without which no garden can ever be kept in good order. A proper system of water supply is another indispensable point to secure success, for in this country, for several months of the year, we are entirely dependent on artificial watering to secure the life and health of our plants ; and last, but certainly not least, we have to consult the individual ideas of the owner. Some perhaps will desire to devote the space available exclusively to foliage or flowering plants or shrubs ; others may allot a large portion to fruits or vegetables. Many demand that "the queen of flowers" shall hold a prominent position, and a few may be ardent admirers of annuals. Again we have those who aim at a higher standard, and devote most of their love to Orchids, Ferns or the more delicate foliage plants. To whichever class or division the inclination may tend, so surely in laying out a garden, a predominant position will be given to the object of his choice. In many instances this is carried out to a most irrational extent, so much so, that to most spectators it would seem that the unfortunate owner kept his garden as a source of selfish amusement only, and knew nothing of that pleasure that all true lovers of gardens feel, in having others to join with them in their admiration of their favorites as well as to receive any hints or instructions they can give, and that kindly criticism which is so essential to our proper advancement in the cultivation of the varied subjects of a garden.

In laying out a garden we must have in view the object for which it is intended. If it is desired to be entirely of an ornamental nature, forming a pleasant view from the windows, or an agreeable promenade, the ground must be laid out with a lawn as extensive as the space available will admit of ; this should be embellished with suitable groups of foliage or flowering shrubs ; and where the grounds are of sufficient extent, specimen plants of Araucarias and trees of a similar nature may be introduced with advantage. A few well kept flower beds should be arranged in the foreground in a conspicuous position, the whole being backed up by tall shrubs or trees, so as to hide the boundary lines. The paths or roads should be arranged so as to show as little as possible ; but above all there should be plenty of grass, and to produce a good effect it must be well kept.

In designing what may be termed a "general" garden, that is, one that will embrace flowers, fruit and vegetables, we must of course select the most prominent place for the flower garden, arranging it similarly to the one described above. The portion allotted to vegetable culture must be fully exposed to sunshine, but at the same time so arranged as not to form a conspicuous object and thereby mar the pleasing effect of the whole, as this portion, for the greater part of the year, presents but a very unsightly appearance. The fruit department or orchard, should be placed as far from the house as possible, and should always be arranged on the northern or western boundary. It will then in no way interfere with the development of the fairer objects in the garden, by robbing them of sunlight, but in this position will, as they attain maturity, materially break the force of the hot winds that are so prevalent in many parts of India. Where roses are deemed a desirable acquisition, a position similar to that mentioned for vegetables should be assigned to them, for although universally admitted to be the most beautiful objects in the whole vegetable kingdom, are unfortunately of such untidy habits, and especially so in this country, that excepting at the period when they are in flower, are best kept in the back-ground. Possibly some of our readers who are ardent rosarians, and who look upon their favourite flower as the "all in all" of a garden, may demur at such a slight being cast upon it, and will obstinately determine to give her the same prominent position in their gardens that she occupies in their affections.

One of the greatest difficulties we have to contend with in this country in laying out a garden, so as to produce a pleasing effect, is its extreme flatness. Where there is but a small extent of ground, this defect is easily remedied by the selection of trees or plants of suitable growth, and planting so as to produce an apparently undulating surface; but where a large area has to be dealt with, this frequently presents difficulties that are not easily surmounted. Of course where expense is no object, an undulating surface of any extent is easily made. After this is completed, the question arises, how shall we dispose of all the surplus water that would otherwise accumulate in the lower portions? A part of this will, of course, be carried to artificial tanks or lakes reserved for the purpose. But to get rid of the remainder is the problem, and in certain districts, where we have, perhaps, a natural fall of not more than one foot in a mile, is one very difficult of solution. Again there is the suitability of soil to be considered. In many parts of India we have a surface soil frequently not more than one to three feet in depth, and a sub-strata totally unfit, except after long cultivation, to support any kind of vegetation. Lastly, climatic influences must be borne in mind. In districts that are subject to a long season of drought, accompanied by fierce

hot winds, few plants or trees could be expected to survive if planted at any considerable elevation above the ordinary ground level. As a rule, therefore, it is advisable to select such designs as are adapted to a level surface ; having done so, and decided on the more prominent features to be aimed at, the next step is to operate on the ground itself, and in doing so we should first have a clear conception of what is to be done, and how we are to do it. By doing this we shall avoid any vexatious delays that would probably otherwise occur, by having to make alterations in our plans after the work is once in progress. Some of our most experienced landscape gardeners recommend the formation of a model of the garden on a small scale in a box of sand or similar material, or in a small portion of the ground. The amount of ground apportioned to each department ; the position of roads, shrubberies, or beds ; the undulations or gradations of the soil, and, if considered necessary, even the effect of the planting, may in this way be graphically illustrated.

DRAINAGE.

Attention must next be given to the surface of the soil. If it is on what may be termed a *dead level*, we must first proceed to give it a sufficient slope to insure all excess of water being speedily carried off. The method of doing this will of course depend upon the best means available, the incline should be in *one* direction only, and this, falling away from the building which the garden surrounds. A slope of 1 in 100, will be found ample for most positions ; or where the soil is of a light porous nature, 1 in 200, will generally be sufficient. The former, however, is a safer limit. Having secured a system of surface drainage that will effectually prevent all fears of its ever becoming water clogged, we should next turn our attention to *sub soil* drainage. This is a subject that has received very little attention in this country, though at least for several months in the year it is much more required here than in Europe. Ordinary earthen pipes, two to three inches in diameter, are easily procured from native manufacturers, and answer the purpose admirably. The depth of the drains will depend upon the fall available for an outlet and also the nature of the soil. In light soils that absorb moisture quickly, they may be placed at a depth of four feet, but in stiff retentive clay, $2\frac{1}{2}$ to 3 feet will be sufficient. The main object of sub-soil drainage is to remove surplus water as quickly as possible, and for this reason must be placed nearer the surface in heavy soils, as water naturally takes very much longer to percolate through them than in others of a sandy nature. Mr. D. T. Fish, one of the most successful modern English Horticulturists, thus describes the value of sub-soil drainage. "Drainage, as popularly understood, means the art of laying land dry. This however, is a very imperfect definition either of its theoretical

principles or practical results. Paradoxical as it may appear, drainage is almost as useful in keeping land moist as in laying it dry. Its proper function is to maintain the soil in the best possible hygrometrical condition for the development of vegetable life. Drainage has also a powerful influence in altering the texture of soils. It enriches their plant-feeding capabilities, elevates their temperature, and improves the general climate of a whole district by increasing its temperature and removing unhealthy exhalations and foetid miasmas—the fruitful hot-bed of fevers and agues—which desolate all damp districts. It lays land dry by removing all superfluous water ; it keeps it moist by increasing its power of resisting the force of evaporation ; it alters the texture by the conduction of water, and by filling the interstices previously occupied by that fluid, with atmospheric air ; it enriches the soil by separating carbonic acid gas and ammonia from the atmosphere, and by facilitating the decomposition, absorption, and amalgamation of liquid and solid manures. It heightens the temperature of the earth by husbanding its heat, and surrounding it with an envelope of comparatively dry air, and by substituting the air for water withdrawn through the interstices of the soil ; for while the tendency of excessive moisture in the soil is to mass into an almost solid substance, so the tendency of air is to bind the whole, divide its particles into separate atoms, and to render it porous, and the more porous a soil is the greater is its power of resisting evaporation. For this reason porous soils are more moist in hot weather than those of a more tenacious character.

Drainage enriches soil in another way. All rain-water is more or less charged with carbonic acid gas and ammonia ; now the larger the quantity of rain-water that passes through the soil, the greater will be the amount of these gases brought in contact with the roots of plants. Nor is this all ; solid manures of the richest qualities are comparatively useless on wet, heavy soils ; for while a certain amount of moisture is essential to the decomposition of manures, an excess arrests the process, and all the most soluble portions are washed out long before it is sufficiently decomposed to enter into the composition of plants. Judicious drainage, therefore, places the soil in a proper hygrometrical condition for performing its important functions.

SOILS.

Having secured a reliable system of what may be called top and bottom drainage, we must next turn our attention to the quality of the soil. The old maxim of "Take a thing as you find it," is too frequently believed in, or rather practised, by many would-be gardeners. No soil is naturally so rich, but that it can be improved by cultivation ! By this we do not necessarily mean heavy dressings of unctuous manures as many probably imagine. There

are other means by which the quality of soils may be materially improved, one of the principal of which is deep digging or trenching; and in laying out a new garden this operation should never be omitted. Where we have a strong, deep soil to operate on, it may be turned over to a depth of two to three feet. The object of trenching or digging to such a depth is to prepare it for the nourishment and support of deep rooting plants, not only by loosening the soil, so as to allow their roots a free passage through it, but also to enable it to readily absorb oxygen and the other constituents of the atmosphere. Deep cultivation means not only an extension of roots, but an increase in their number, the result of which must tend to an increase in the size and vigour of the plant.

As to the subjects to which it is applicable, there is hardly an exception, because, if a deeply stirred soil is not absolutely necessary for a few shallow-rooted plants, it is beneficial in many ways, as excess of moisture can run away quickly, and it also increases the warmth of the soil. Deep cultivation, it must be understood, may be rendered of little value if the work is not conducted on sound principles. The deep trenching of any particular piece of ground may do much good or harm according to the nature of the sub-soil. Yet if ground is moved to a considerable depth, its fertility is increased if the work is done in a proper manner. By this we mean that the nature of the soil at one foot or more below the surface should alone decide how the work of deep cultivation is to proceed. If the good soil should extend to a depth of two feet, the ordinary way of bringing the bottom soil to the surface will suffice: but if the lower stratum is much inferior to the surface soil, it ought not to be brought to the top. This is a very important point, for crude soil will render the surface quite unfit for the reception of small seeds, or any choice crop, for two or three years to come.

To a certain extent the nature of the soil must determine the amount of preparation necessary, but whether the staple is rich or poor, it is benefitted more or less by deep cultivation. I have always secured the best results when reasonable care has been bestowed on its preparation. A good deal may be done in a rough and ready way where manure is plentiful, but where it is not, more care is certainly necessary in preparing the soil. So great is my faith in deep-trenching and other attentions to the surface, so as to secure a good tilth, that I would rather dispense with a portion of the manure, if I could give due attention to the preparation of the soil by frequently stirring the surface, and by placing round the roots of newly planted subjects a little fine soil. Most of us know what influence a rich deep soil has on the majority of crops, and the satisfactory results secured by somewhat hurrying planting operations. But in gardens where the supply of manure is limited, the soil naturally poor, and the preparation neglected, the results

are most disappointing. The moral of this reasoning then (and it is borne out by practical experience and observation) is, that in gardens where the soil is poor and the supply of manure limited, more attention is required to deep digging, not that extra labour in preparing the soil is equal to a full supply of manure, but it will go a long way to make up for the deficiency.

Although we frequently hear doubts expressed as to the beneficial effects of frequent and deep cultivation—and some go so far as to quote instances of soil that has been injured and rendered less productive by it—we must, from our experience, come to the conclusion that in all such cases the waste of labour was due to an utter disregard, and in defiance of anything approaching scientific cultivation. It must be obvious to the most causal observer, that although the manual labour attending the act of trenching the ground does not require any great skill to direct it, yet its utility may be more than counteracted if done on a haphazard plan, without any regard to character of soil, the nature of sub-soil, and whether freshly broken up or old, and what is sometimes termed "worn out" from repeated cropping. I have no hesitation in saying that the "worn out" theory is entirely brought on by substituting shallow surface stirrings for good, deep and thorough cultivation, and in some measure by lack of attention to the proper rotation of crops; for although land may be destitute of the elements necessary to perfect one crop, it may be rich in what another requires; and when the surface is cropped repeatedly with crops nearly allied to each other, it may only yield moderate results, whereas if fresh soil were brought to the surface by deep cultivation, the very elements that are wanting may be restored, and substances converted into food for future crops by atmospheric action that would never have been available if buried deeply, as the more solid the land becomes, the more is the soil closed against the action of the air. For land of this description, trenching by merely substituting the bottom spit for the top is best, and fresh unrotted manure will be more beneficially worked in at the bottom of the trenches than thoroughly decayed material. The earlier this is done in the season the better, as the lengthened exposure to the air will pulverise and sweeten any crude substances brought to the surface, and furnish abundant food for bringing succulent crops to perfection at all seasons, as in exceptionally wet seasons, the thorough drainage ensured, renders the land warmer by admitting the air; and during periods of drought there is no remedy half so successful as a good depth of thoroughly pulverised and enriched soil where the roots can descend and find plenty of soluble food at all times. No amount of labour expended on watering and surface stirring will do more than mitigate the evil arising from shallow cultivation at such periods, for it is the lack of food that deprives vegetable crops of their succulence.

When we come to deal with freshly broken-up land, or where a bad sub-soil exists, the manner in which the trenching is performed must be modified according to circumstances, but we never yet saw land that could not be made fit for first class garden produce by the addition of substances in which it was deficient. When the sub-soil is exceptionally poor—either clay or sand—but a small portion should be brought to the surface. With heavy land, such substances as leaf mould, ashes or sandy dressings, will prove more beneficial than unctuous manures, which will be more profitably employed on lighter descriptions of soils; but it is better in such cases, not to bury it so deeply, as when the sub-soil is very porous, the manurial properties are liable to be wasted by the superabundant drainage.

Having now got the ground into shape, and what may be considered all the heavy work completed, the most advisable thing to do, is to suspend our operations for four or six months, simply growing a crop of vegetables, such as turnips, carrots and potatoes on the ground during this period; the object of this is to allow of the thorough incorporation of the soil and also the removal of weeds. Any portions also that have been made up from a greater depth than others will have time to subside, for no matter how firmly the soil may be rammed down, subsidence to a certain extent is unavoidable, and we should then be able to make good any inequalities before we proceed to our permanent work.

This delay would be speedily compensated for by the increased vigour and rapidity of growth, and the greater degree of success attained. All these arguments, however, I am assured, will fail to overcome the proverbial impatience of the majority of amateur gardeners, who, at least in this pursuit, "have not learned to labour and to wait," and are mainly guided in all their endeavours by the idea of obtaining an immediate effect rather than to a satisfactory permanent result.



CHAPTER III.



Planting and Transplanting.

HAVING drained and levelled the ground for the proposed garden, we must next turn our attention to the proper method of planting the same, so as to produce the best possible effect.

The first object of the planter should be to examine the soil and localities to be planted, to ascertain which parts are most exposed to the prevailing winds, and to consider how he can best arrange his plants so that they may be most sheltered, and be a protection to the others which are to be guarded by them. Clump planting is far preferable to lineal or individual planting, and for this reason, that clumps, when carefully planted, afford the greatest possible resistance to atmospheric influences, and protection to each other—the tallest plants being placed in the centre and the surrounding ones being so arranged as to form a cone.

The mistake that is generally made in the formation of shrub beries is in the hap-hazard system of planting employed, instead of making a proper selection of suitable species, and arranging them according to their characters and habits, giving them sufficient room to grow to their natural size without encroaching on each other. This is a plan that should always be adopted, and afterwards, if an immediate effect is desired, all vacancies can be filled in with common plants, taking care to cut back or entirely remove these, as the more valuable permanent inhabitants require an increased space. Unfortunately, in most cases when once planted and established, shrubs are liable to be forgotten or uncared for, till they become overgrown, when a general pruning or cutting down is resorted to, and the consequences of neglect are then discovered in the many choice but weaker subjects that have succumbed in the struggle for existence.

Although it is not desirable to cram a garden with too many species, still variety must not be lost sight of, and this can only be secured by a judicious blending of evergreen, deciduous, and flowering subjects ; the former must, of course, predominate, otherwise the borders or beds will become almost bare at certain seasons of the year. Ornamental or variegated foliage plants must also be used in proper proportions. On this point there is a great diversity of opinion ; variegated foliage seems to have the effect on some persons that a red flag has on a bull ; others are hardly satisfied unless a plant has foliage, either variegated or of some other colour than green. In this, as in many other matters, however, doubtless *in media tutissimum ibis* holds good.

Variety is, no doubt, pleasing to every one, but where all is variegated there, perhaps, will be the very want of variety desired. In planting a shrubbery, subjects with variegated or with whole coloured foliage otherwise than green, such as yellow, red, bronze or white, may frequently be used with the greatest advantage, but the mistake should not be made of overdoing the variety which may by their means be produced. Green, or various shades of green, should, as a rule, always predominate. Very beautiful effects may be produced with various shades of green only, but whatever effects are produced in this way may be immensely heightened, and rendered infinitely more striking, by the introduction, here and there, of subjects having leaves of various shades of yellow, crimson or any other decided colour.

All that is necessary, is to make, in the first instance, a judicious selection of suitable kinds, and to avoid the planting in confined or restricted situations, especially near dwellings, of trees which naturally grow to a large size. We may all agree to love the big trees, but it may frequently be very imprudent to plant them. "Oh, but," says somebody, they grow quickly and soon make an effect, and when they become too large you can easily cut them in, don't you know?" Yes ! to be sure, we can endure to be overshadowed for several years, to lose our share of wholesome light and air, to have all our smaller garden plants killed, and then seek relief by hacking the big trees about and rendering them hideous for ever after. Better far to begin well, for if you do not, you have no guarantee that you will end well. There are many exquisitely beautiful trees of small growth that are not at all particular as to conditions, and are likely to thrive in any garden in the midst of houses, provided there is space enough over and around to afford them full daylight. These small trees are not only to be desired on account of their elegance or beauty, and because they will permit of the growth of plants beneath them, but also for this reason—their happy possessor will never be tempted to chop off their heads or hew them into unsightly forms to effect a compromise between the leafy shade and the health-giving light of heaven.

This variety of trees and plants is now so rich with us, that, given a little knowledge and taste, and a careful selection of the right subjects, with, of course, intelligent attention on the part of the cultivator, our gardens may be rendered not only exceedingly attractive, but the highest effects may be obtained, and at but little expense, for we shall generally find that the older and cheaper varieties of plants are the best adapted for out door cultivation. Take the Croton or Dracæna families as an instance—the oldest species of these thrive satisfactorily in Bengal when planted out in almost any position ; but were we to employ varieties that had only been a year or two in the country, we should probably lose them all. It is not till they have been propagated to the third or fourth generation, that these plants become really hardy in our climate ; and it is the same with almost every other genera.

After having made our selection, the next stage in successful planting is to fix plants in the soil so as to give them every advantage and enable them to root freely in it. The great point is to secure as many roots as possible, and to preserve each and all from injury, and when placing in position to spread them out to the fullest extent. Another thing that militates a great deal against the successful transplanting of trees, is leaving their roots exposed to the air, through which they become dry and shrivelled, and not only do the roots get in this unsatisfactory state, but the bark, the stem and branches contract in the same manner ; and when allowed to get in this condition it is a long time before the sap vessels come into proper working order again. To prevent this shrivelling of freshly moved trees, it is a good plan, if they be large, to bind their main stems and branches with moss or grass, so that the whole surface is enveloped in a covering that will preserve plenty of moisture and keep the bark plump. Where large plants or trees are employed, it is generally advisable to shorten or cut away a portion of their tops. This naturally reduces the strain on the roots, and also prevents the wind from shaking them about, which would deter their taking root and thus becoming established.

All trees and plants require to be planted more deeply in light soils and in exposed situations than under other conditions ; and care should be taken that the bottom branches of the outside rows should be imbedded in the soil so as to give them a firmer hold of it. All the nourishment that plants derive from the soil in which they are planted, must necessarily be drawn through their roots, and if the plants are not kept steady so that the extremities of the roots may absorb the elements of their after-composition, it is impossible they can thrive.

Staking, pruning, and trimming are also essential elements which should command attention. It often happens that the

mode of staking and tying adopted, is more injurious than beneficial, and leads to much expense and unnecessary labour. If the selection, and the planting of the trees and shrubs can be so arranged as to render staking unnecessary, so much the better, as it is a grand point of advantage in more senses of the word than mere expense. Good or well prepared soil, deep planting of carefully selected suitable subjects, the top being reduced so as to be as little shaken by the wind as possible, is far preferable to a multitude of ungainly stakes and innumerable ties, which are liable to become detached and gall the bark of the trees, causing irreparable injury to their stems. But when supports cannot be dispensed with, the best mode is to use single stakes, fixed firmly in the ground in immediate proximity to the trees, which should be first tied close to the ground and gradually at given distances upwards.

The pruning necessary will consist mainly of thinning out of the branches where they are crowded by crossing or intersecting each other, and beyond this, and the removal of dead or decaying wood the less of the knife the better. Whatever cuts are made should be always close to a bud or shoot, and then there is no dying back, and the wound quickly heals over.



CHAPTER IV.

Lawns.

INCE the days of good Queen Bess, when landscape gardening first began to be looked upon as an art, every authority on the subject has invariably admitted that a proper proportion of Lawn is indispensable in the formation of a garden. Other systems have been introduced, notably the Dutch, in which grass is frequently entirely dispensed with, its place being occupied by gravel or marble of various colours, and that modern craze—"geometrical gardening,"—where even in instances when grass was not actually ignored, it was so hacked about and mutilated as scarcely to be recognisable. A proper amount of green surface is to a garden what a background is to a picture; without it, although we have a mass of beautiful objects faithfully delineated or arranged, there invariably seems something lacking,—a want of tone, or a seeming harshness or dulness in the blending of shades; but, let a suitable background be introduced and the effect is changed as if by magic, the harshness or dulness of colour disappears, and in their place at once we have a harmonious effect.

How much of the pleasure of some gardens is lost through ill-kept or badly arranged lawns. The grass should always be looking its freshest and best, provided the lawn mower is not allowed to rust in idleness, which happens more frequently than is desirable during busy seasons for want of labour. In a large garden not long since—an example of not a few, I am afraid—the writer saw a spacious lawn in front of a house, and surrounded by shrubberies in that condition so vexatious to the true gardener's heart, uncut, rough, and littered over by leaves and broken twigs and full of worm casts. "No time to cut it, and do not see any

prospect of getting at it for a month yet," was the owner's lament. A great mistake is this neglect of the grass, entailing so much scythe work and after-clearing before the lawn mower can get to work. It is the least economical plan too, and a sure way of increasing noxious weeds. The way to keep the sward clear of these, is to have the mowing machine continually moving, so as to prevent their seeding. Scythe work should be abolished as far as possible; it has no business to be where the lawn mower can get to work. We frequently hear complaints about the difficulties that have to be encountered in keeping a lawn in good order; one of the most common of these is, that the grass is too thin and cannot be induced to form a good thick turf, although regularly cut and copiously watered; and many seem to believe that this is all that is needed. But such is far from being the case. As well might we try to grow cabbages, celery or even good roses on water diet only. We all know what the result of such an experiment would be. Some will probably exclaim "that grass is only a weed, and as such requires no care or attention to induce it to grow." But were not cabbages, celery and even roses weeds also? And is it not entirely to liberal cultivation that their good qualities have been developed? To keep a lawn in really good order we must cut it at least once a week, and we may safely assume that at each cutting, on an average, we shall remove at least half an inch of sward or a total of twenty-six inches in a year. This represents several tons of vegetable matter per acre being removed from the soil, and if this is allowed to go on year after year without any attempt being made to replenish the drain on the soil, it naturally follows that it must become impoverished and incapable of producing a good crop. Some recommend that the cuttings should all be left on the ground. By this means we return to the soil what it has produced, and in a certain degree counteract the strain on it; but still this plan has many objections, and for my part, I should certainly never advise its being adopted, for how people can tolerate the untidy appearance that strewn grass gives to a lawn, I cannot understand, as every puff of wind carries it into the walks and gives the garden the appearance of a miniature hay-field. Mowing machines are now almost perfect in every respect; they will cut long grass or short, and pick it up or scatter it abroad, or leave it at will. Not only are they equal to all this, but they are light and durable, and work easily, very different from those in use but a few years ago. What does lawns so much good is not the grass left, but the one shave it gets by setting the machines at such a height that will not cut into or damage the heart of the plants, as, when snipped too close, the sun scorches them up and weeds soon take their place. Some lawns are particularly subject to weeds, which are a great disfigurement, but by a little perseverance they may be easily got

rid of. The best way in which to deal with them is to get some vitriol in a wide-mouthed bottle and put a strong wire round its neck to carry it by, when by dipping in a notched stick a few drops may be let quickly into the crown of each weed, which will soon burn out the heart and cause it to perish. It is of course necessary to use the acid with care, as it will blister the skin and damage any clothing that it touches. Another way of extirpating weeds is to spud or cut them out as soon as they are large enough to be distinguished. Moss, too, is a great eyesore, and many lawns are subject to it, and if not checked it soon gets entire possession of the ground and chokes out everything else; besides which it is a terrible strain to men working a machine, for when dry it is most difficult to cut. Some have an idea that moss on lawns is caused solely through want of drainage, but we frequently find that the driest of soils are most subject to it, for if grass gets killed or weakened by the hot weather, moss and weeds quickly take its place. The best cure for it is hot lime, which, with a little soot added, greatly improves the appearance of the grass. To get the lime on regularly, it should be slaked and mixed with moist sifted earth, which by giving weight, prevents it from flying about when being sown. A rub with the back of a rake will help to work it in, and break up any small lumps, if these are left exposed to the air for a short time. Not only is a good dressing of lime highly beneficial to lawns on account of its killing moss and encouraging the spread of grass, but it destroys and drives away worms, which are one of the worst nuisances we have to contend with on lawns; for no sooner does one sweep up, or roll, to get rid of the castings they throw up on the surface, than they are at it again, making the sward look as dirty and untidy as ever. In cases where lawns are worn, or from any cause are thin and patchy, any period from July to September will be found a good time for repairing them, as, where fresh turf has to be cut and laid, it cannot well be done after the rains. If deferred till late, it requires a good deal of attention and labour in watering to induce it to start and lay fresh hold of the ground. The most suitable turf for mending lawns is that from a close fed piece of ground, where the grass is always short, or from near roads or paths where it has been subjected to a good deal of traffic.

In making new lawns, one of the greatest difficulties is to secure a uniformly solid surface, as in filling up inequalities it is almost impossible to ram down soil so firmly as is done by time. It must be obvious to every one that unless the base of grass lawns be of uniform solidity, they will quickly subside in the most erratic fashion, leaving labyrinths of inequality instead of that greatest charm of a perfect lawn—a smooth or even surface.

A good lawn, suitable for either tennis, croquet or cricket, may be formed in the following manner. Comparative dryness

being absolutely necessary, the sub-soil should be efficiently drained. This should be done by means of 3 inch pipes placed 3ft. 6in. or 4 feet below the surface in diagonal lines across the ground 10 feet apart, giving a fall of at least 1 in 100. A larger pipe should take the water from the ends of all the drains and convey it to the most convenient outlet. Care should be taken in laying the pipes that the joints are placed as closely as possible. If the soil is of a very retentive character, sufficient should be removed to allow for two feet of filling up. Having removed the bad soil, another row of pipes should be placed on the surface, in the same direction and between the first mentioned drains, to carry away the water in the same manner as before. This affords an excellent additional security against excessive moisture. The first foot of filling in should consist of cinder ashes, broken bricks or small stones, or any similar porous materials ; this must be laid evenly and rammed or rolled until the whole is fairly compact. The second foot should consist of fibrous soil of a friable loamy nature, but not clayey loam ; the top spit from any grazing land is generally suitable for this purpose. This must be well pulverized, levelled and firmly rammed ; one inch of sharp sand may then be placed on the top in order to get a perfectly smooth and even surface. Having by these means ensured a base free from stagnant water, soil of good and uniform quality, equally solid throughout, we must next proceed to the obtaining of a good turf ; this may be done by any one of the three following methods.

Turfing.—This is undoubtedly the most expeditious method of forming a lawn, and where plenty of turf of the right description is available, should always be employed. For this purpose we should select it from positions where the grass is as short and thick as possible, and entirely free from weeds or other coarse grasses. The turf should be cut of a uniform size and thickness, and laid on evenly and closely and then firmly beaten down. In dry weather it is advisable to give a sprinkling of very fine soil to prevent burning and to fill up the joints ; water should also be applied until the turf has got good hold of the soil. The only grave objection to this plan is that of expense. Where turf has to be brought from a long distance this is almost prohibitory, but where the turf is near and labour plentiful, under intelligent supervision, the expense is less than might be assumed.

Dibbling or Inoculating.—This is the system generally adopted in this country for the formation of lawns, and is undoubtedly the cheapest of all methods. It differs from the former, only that the turves instead of being laid so as to cover the whole surface, are broken into small pieces one to two inches in diameter and dibbled into the soil about two or three inches apart ; they should be well beaten or rammed down and freely supplied with water,

the whole surface being rolled regularly every day. Of course lawns thus formed look unsightly for a short time, but to those who can afford to wait for two or three months, the saving of labour and material is so great as to strongly recommend it as the cheapest and at the same time the simplest method of renewing or making grass lawns.

Seed.—If seeds are used instead of turf, the ground should be broken by the use of a sharp-toothed iron rake previous to sowing, and it is a good plan for the better distribution of the seeds to mix them with a little fine earth or sand when they can be sown with greater regularity. After sowing, it is advisable to scatter a little fine soil over the surface and to roll down when dry, as then the seeds get well covered and are out of the reach of small birds that would otherwise devour them. Sowing seed, however, is of but little use unless the young plants are furnished with a proper supply of food; too much care cannot, therefore, be exercised in the preparation of the soil, for although the seed may come up fairly well, a good close carpet of grass can never be formed unless the rooting medium is of a nature to allow of the roots travelling freely in it. Cleanly culture is of the highest importance. Every weed should be pulled up before it has time to encroach on the grass: many a promising grass plot is ruined in its infancy through want of attention to this matter.

HINTS ON THE FORMATION OF A LAWN FROM SEED.

In the first place, see that your ground is thoroughly drained and well prepared, sowing *at least* fifty pounds of seed to the acre.

Perhaps the best description of soil for a lawn is the stiff loam or clayey soils which predominate in so many districts. This ought not to be by any means too rich, as a rapid growth is not wanted in the grasses of a lawn; but in preparing it for laying down, let the surface be as much alike in quality as possible, and do not stint the quantity of seed. A very stiff clay is no better than a dry sand for resisting drought, as it is in a measure sealed up against the insertion of the roots, and the surface contracting by the withdrawal of moisture, it is liable to crack, etc., to a great depth. Nevertheless, a stiff soil usually makes the best lawn.

If your ground is in condition to raise a good crop of potatoes, it will make a good lawn; add about half a ton of bone dust to the acre, harrowed in before sowing the seed. The success of

establishing a good lawn depends much on the season and the condition of the ground at the time of sowing. A very slight raking in will protect the seeds much, or a sowing of wood ashes will render them distasteful to birds. Rolling, however, is at all times indispensable.

One important thing ought not to be forgotten in the preparation of the ground. Let it all have a surface of about six inches alike, for nothing looks worse than to see a lawn grown all in patches. One exception, however, may be mentioned, and that is, if there be any steep slopes facing the south, or other exposed places, let the earth on them be better and deeper than on the ground level, as they are more liable to burn out. When the grass becomes well established, it should be frequently cut. The oftener you mow, the finer your grass will be.

It is proper here to observe that no lawn can be maintained long in good order without successive rolling. Mowing alone will not secure a good bottom without that compression which the roller tends to give. The rolling should be done before the ground becomes dry.

To Grass a Bank or Terrace.—For each square rod, take a pound of lawn grass seed and mix it thoroughly with six cubic feet of good dry garden loam. Place in a tub, and add liquid manure, diluted with about two-thirds of water, so as to bring the whole to the consistency of mortar. The slope must be made perfectly smooth, and then well watered, after which the paste should be applied, and made as even and as thin as possible.

The secret of successful lawn making is—first, a well drained sub-soil, and secondly, proper materials in sufficient quantity for forming the surface ; this is very important. Soils which contract and expand in a marked degree under climatic influences, will never produce a good turf. What is required is a fibrous, homogeneous soil, which protects the surface rooted grasses from drought and heat. Grass in growing also emits roots just above the surface of the soil, and by applying a periodical top dressing of sand for them to work among, a mould of sand, a few inches in thickness, would soon be formed, which would check the gross character of the grass and make it spread out and grow thickly, producing that fine, velvety appearance and soft tread so much desired in lawns. The surface water will also pass freely down, which will keep the grass from becoming muddy and plastic.

German method to Grass a Lawn.—For each square rod to be planted, take half a pound of lawn-grass seed and mix it intimately and thoroughly with 6 cubic feet of good dry garden earth and

loam. This should be placed in a tub, and liquid manure diluted with about two-thirds of water added and well stirred in, so as to bring the whole to the consistency of mortar. The ground must be cleaned and made perfectly smooth, and then well watered, after which the paste just mentioned should be applied with a trowel, and made as even and thin as possible. Should it crack from exposure to the air, it must be again watered and smoothed up day by day until the grass makes its appearance, which will be in from eight to fourteen days, when the whole will soon be covered with a close carpet of green.



CHAPTER V.

Roads and Walks.

Ww—

FROM a landscape point of view the disposal of these is of the utmost importance. They should be so arranged that they appear and disappear before and behind plantations, prominences, etc., and generally only the easiest curves should be visible. The lines which roads and walks should take are those which open to the most interesting parts of the grounds or afford distant views; their number should as limited as possible, consistent with convenience, especially where the ground is well drained and accessible at all weathers, as it is much more pleasant to walk on turf than on hard roads. It is, however, desirable that one circuitous walk should surround the outskirts of the lawn; it may be fringed with borders and plantations at the ends of the lawn, but quite hidden from the centre. The carriage entrance will be the principal, and in most cases the only necessary road within the pleasure grounds proper; its curves should be especially easy. It is not desirable that a carriage road should be seen from the house, except that portion in close proximity to it, and even this may be partially screened by judicious planting of overhanging trees.

Walks, as a rule, should for convenience, take the shortest route to a given point; if not, a foot-path will speedily be formed, which is not only unsightly but a reproof to the original maker of the walk. Had that taken the shortest and most direct cut between any two or more given points, the foot-path would never have been made. But it is a mistake to apply this hard and fast rule to walks in pleasure grounds of large dimensions. In such, the walk may become no mean feature, while its main object is to lead on the most pleasant lines and by means of the easiest gradients

to all the main features of the landscape. This is mostly accomplished by a series of easy and graceful curves. But herein lies a danger, on which many walks have had beauty and utility alike wrecked. No curve should be introduced capriciously, nor be repeated too often. It seems frequently to be forgotten in choosing the line of a walk, that a series of meaningless curves are more monotonous, if less stiff, than a series of straight lines.

In each curve there ought to be an obvious meaning, real or apparent, and it often taxes the highest skill to succeed in this point in small places in which long walks are wanted. Again the same curve should never be so often repeated that two or more are visible from the same point. Some also err in considering every divergence from the straight line, a line of beauty. No line is less beautiful than a curve without either meaning or grace. Curves should, above all things, be flowing and easy; and never, unless in the case of sharp turns which are sometimes unavoidable, should they be abrupt. It is distressing to meet at times with mere zig-zag walks led hither and thither, without taste or design of any kind, and yet, because they are not straight, they are assumed to be beautiful. Where beds, borders, or grounds are so narrow as to render impossible the flowing grace of a curve, it is better not to attempt it, but to choose a straight walk.

Next to the line of walk, its width is the most important point. Thousands of walks are ruined by their narrowness. Three feet walks must needs look mean unless in the smallest places. Five feet should be the minimum width, and six feet is far better and more effective than five feet. In large places, or in prominent positions, nine feet, or even twelve feet, may be essential. But the relation of width of walk to size of grounds needs to be nicely adjusted.

A nine foot walk, in a very small garden, would appear even more ridiculous than a three foot one in grounds perhaps five or ten acres in extent. Wide walks give an air of grandeur and a feeling of abundant space to large gardens that hardly anything else can impart. They are also more useful for exercise, and make walking so much more enjoyable by enabling several to walk abreast without overcrowding.

To many, however, the quality of a walk is more important than either its line or breadth. Garden walks ought to be dry, smooth, hard, slightly elastic, bright and clean. A wet walk is a perpetual source of discomfort. To have a walk thoroughly dry, the earth on which it rests must be made so first. The use of porous, or even impervious materials, will not insure a dry walk, unless it rests on a dry basis of earth. As is the foundation, so in the end will be the walk. The earth must be drained and a free outlet

provided for the water if the walk is to become and remain always dry. In the formation of carriage drives, or any other roads, intended for wheel traffic, we should remove at least twelve inches of soil, and after having paid due attention to drainage, we should flood the hollow thus made with water to a depth of at least three inches; the object of this is to secure an equable subsidence of the whole surface. After the water has been entirely absorbed, and the soil become sufficiently dry to work without clogging, we must proceed to ram or roll it down as firmly as possible, taking care to fill up all inequalities that may appear during the operation. Many will probably deem this useless trouble, and consider it quite sufficient if they only pay proper attention to levelling when they apply the top dressing to the road or path, such, however, is not the case; for unless we commence work on a level foundation, and proceed by adding each layer evenly over the entire surface, we shall never be able to form good solid road, at least not one that will wear well. Having secured a solid, even surface, we must next proceed to the formation of the road. The first layer should consist of well-burnt, or rather over-burnt bricks, and these should be placed evenly in diagonal lines packed as closely together as possible. The next stratum will consist of a six-inch layer of broken bricks (broken so as to pass through a two-inch ring), this after being distributed evenly should be well rolled, supplying plenty of water during the operation. Where the question of expense is not objected to, a coating of lime, at the rate of a maund to every hundred square feet of roadway, should be added. This must be well washed in and frequently rolled, till the whole forms a mass almost as solid as concrete. The third layer may be made with about two inches of broken brick from $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter; this must also be well rolled down and thoroughly incorporated before we proceed to give the final dressing. This generally consists of about one inch finely broken brick or khunkhur about the size of peas. Where, however, a tightly bound even surface is desired, it is better to mix this with an equal quantity of soorkey or powdered bricks; this will insure the formation of a smooth, even surface, impervious alike to water and worms—pests that are frequently very troublesome in badly made roads.

In the making of walks or roads that are intended only for pedestrians, the coating of bricks used in the lower strata may be dispensed with, and in dry situations, the layer of coarse broken bricks may be reduced to four inches, otherwise their formation should be precisely the same as the preceding.

EDGINGS.—Where roads or paths intersect lawns, the greensward on each side generally forms a sufficient edging, but in all well kept gardens something in the form of a line of demarcation is necessary to divide or to separate the soil from the paths or roads. In Europe no plant is more generally used for the purpose than dwarf Dutch

Box, but unfortunately in this country it can never be induced to thrive satisfactorily. The Chinese variety, *Buxus chinensis*, grows tolerably well if left to itself, but the moment we commence to cut it into anything like shape, it obstinately refuses to grow at all. *Lonicera Japonica* makes a good edging plant, but requires a large deal of attention as regards cutting. *Alternanthera amabilis* and *A. paronychoides* are also extensively used in Bengal, and are well adapted to the purpose, being extremely easy of propagation, and their deep bronzy colours contrast well with almost every kind of plant. These do better if renewed annually by cuttings during the rainy season. One great drawback, however, in employing edgings of this kind is that they form a very convenient harbour for insects, and in the kitchen garden especially, this forms an almost insuperable obstacle to their employment. The use of what are termed dead-edgings is now gradually taking the place of living ones; they have certainly the advantage of harbouring no insect pests, and if made of proper material, when once fixed are almost indestructible. These edgings are occasionally made of wood; this cannot, however, be recommended for the purpose, as it seldom remains long in good condition. Majolica, Terra Cotta and Glass tiles, in ornamental designs, are now extensively employed in England for the purpose. The great risk and heavy cost for freight prohibit their being imported here. I have, however, experienced no difficulty in having a very good substitute, or rather an imitation of them, made in this country, and at but very little expense; these consist of tiles made of ordinary clay, nine inches deep and twelve inches long, with an ornamental edging on the top edge which, of course, may be varied to suit the taste of each individual, though it is doubtful if an ordinary flower-pot maker, could turn out any very elaborate designs.

Ordinary bricks also, when well shaped and fully burnt, make very strong and effective edgings when carefully arranged; the annexed diagram shows a method that is now very frequently adopted, and if properly done is not only extremely neat in appearance, but also possesses great strength.

CHAPTER VI.

Manures.

THERE is probably no country in the world in which either Agriculture or Horticulture is carried on in such a loose, haphazard fashion as in India, not only amongst the native tillers of the soil, who may be excused on the plea of ignorance : but the same state of things exists amongst those who certainly cannot plead ignorance as the cause of their continued neglect even of the commonest of nature's laws, and in no one point is this lamentable carelessness or ignorance displayed in a greater degree than regarding the question of manures. It seems to be the prevailing idea that the soil is naturally so rich that it is capable of producing crops year after year without any attention whatever beyond an occasional digging and watering.

Manures are applied to the soil to act as food for the plants cultivated upon it. They are divided into two classes, natural and artificial. Natural manures are those derived from decaying organisms, as animal excrements, vegetable refuse and animal matter, as blood, bones, &c. A manure, to be true food must contain at least some element, or combination of elements, indispensable to the plant to which it is applied ; and those manures are best which contain all, or at least most of the elements, required by the plants cultivated, and in as near the same percentage as possible. Our most valuable manures belong to that class which I have called natural, in contradistinction to such mineral or artificial manures as nitrate of soda, sulphate of lime (gypsum), carbonate of lime, &c. Natural manures are derived primarily from vegetable forms, and therefore contain the elements fitted to build up other vegetable structures. The excrements of any animal fed, for instance, on Potatoes, would contain the elements necessary for that crop in very nearly the same proportion as the Potato. Again, an ox fed on Turnips, would furnish the best Turnip manure ; and so on. It is a fact often lost sight of, that any

excrement of itself does not contain *all* the elements contained in an animal's food ; but it should be better known than it is, that certain elements are to be found in the urine and others in the solid excrements. Now when only *one* kind of excrement is used, there is a certain loss, as plants always use the elements in the same percentage. For instance, two plants of the same kind will have the same analysis. Let us take two similar plants—both requiring, say, a large percentage of phosphates or phosphate of lime. The one is planted in soil prepared with manure containing all the inorganic elements in the proportion wanted, and the other planted in soil containing the other elements in due proportion, but with a deficiency of phosphate of lime—so far as the latter plant is concerned, the other elements would only be available to the extent to which the phosphate was present ; and the analysis of the inorganic matters in the plant would be the same, the other elements being left in the soil ; and it would be the same though the phosphate had been given in excess. It follows then, that not only should all the elements of a plant's food be present, but present in due proportion, if possible, otherwise the surplus elements will be lost, or at least useless for the current crop.

It may perhaps be advisable to say here that the food of plants is divided into two sections, the organic and inorganic. The inorganic elements are those which appear in the form of ashes when a plant is consumed by fire. The organic is that part which is driven off, in the form of gas, during the process of burning. The organic elements are carbon, oxygen, hydrogen, and nitrogen. These elements combine to form two distinct classes of compounds—azotised and unazotised. Sugar, gum, starch, and cellulose, may be taken as examples of unazotised compounds, having carbon, oxygen, and hydrogen as their component elements. Fibrine, caseine, albumen, gluten legumine, &c., may be taken to represent the azotised or nitrogenous groups, their component elements being carbon, hydrogen, oxygen, and nitrogen. In addition to these organic elements which are all found in the atmosphere, and in water, there is what is called the morganic or mineral elements which are drawn by the plants from the soil alone. These inorganic elements vary in their percentage in different plants. In some plants lime is a prominent element, as in the Vine, for instance ; others are rich in potash, others in sulphur, and so on. It is generally considered that about eighteen different elements appear in some form or other in vegetable life, rarely simple, however, but as compounds ; phosphorus and lime combining to form phosphate of lime ; phosphorus and magnesia to form phosphate of magnesia ; sulphur and potash to form sulphate of potash, and so on. These compounds are what are called salts. An instance of what a salt is may be found in common salt, which is chlorine, oxygen, and sodium, in chemical

combination, forming chloride of soda or common salt. The elements which enter into the structure of plants are —

NON-METALLIC.

GASES.	SOLIDS.	METALLIC.
		Aluminium, . . Al.
		Calcium, . . Ca.
Chlorine ; . . Ch.	Bromine . . Br.	Copper, . . Cu.
Hydrogen ; . . H.	Carbon . . C.	Iron (Ferrum), . . Fe.
Oxygen ; . . O.	Iodine . . I.	Magnesium, . . Mg.
Nitrogen ; . . N.	Phosphorus . . P.	Manganese, . . Mu.
	Silicon . . Si.	Potash (Kalium) . . K.
	Sulphur . . S.	Sodium (Natrium) . . Na.

These elements are rarely found pure in plants; and when such is the case, it is regarded as an accident, and not as the normal state of things.

Some of these are seldom present save as mere traces, such as iodine or bromine, which appear as iodides and bromides. Others again are almost universally present, and in quantity, such as calcium, which appears in the form of an oxide, or of an oxide in combination with some other element or compound. The oxide of calcium is pure lime, limestones and shells and chalk are oxides of calcium in combination with carbonic acid, and are carbonates of lime. Bone-dust is chiefly oxide of calcium in combination with phosphoric acid, and is phosphate of lime.

Sulpho-phosphate of lime is bones dissolved in sulphuric acid, and in chemical combination with it. Phosphoric acid is phosphorus and oxygen in chemical combination, and sulphuric acid is sulphur and oxygen in combination, &c., &c.

Now, a growing plant requires these to build its structure. A growing plant collects the inorganic elements from the soil, and the organic from the atmosphere, and, combining them in its tissue, builds its structure, or, as we say, grows. An animal does the opposite of this. Using the plant as food, it gives the organic back to the air again through its lungs, &c., and passes the inorganic back to the earth in its excrements. Now it is these inorganic elements that we have got to look after; for it is found that if a plant gets the inorganic elements in the soil, it will find the organic in the atmosphere.

The fruitfulness of a soil is decreased or increased according to inexorable laws. With each crop that is taken from the ground a greater or less amount of fertility is removed, and if this process is continued year after year ultimate barrenness must result. There is no remedy but that of supplying, in the form of manures, what is thus taken away. The farmer must feed the land which feeds him, and through him many others, or in the end, all must starve.

together. I will now endeavor to give a short description of the different manures, and in order to do so, have arranged them in three classes : Animal vegetable, and mineral.

ANIMAL MANURES.

Animal manures comprise the flesh, bones, blood, excrements, etc., of animals. They contain more nitrogen than vegetable manures, and are far more powerful. The standard manure of this country is stable manure, which is composed of the excrements of the domestic animals. Of these, that of the horse is the most valuable in its fresh state, but is very liable by fermentation to lose much of its value. A good sprinkling of salt occasionally will prevent this loss and add very much to its manurial value. The manure of sheep is next on the list, while that of the cow is of the least value, as the enriching substance of her food goes principally to the formation of the milk. The value of each of these manures varies with the food and condition of the animals from which it is obtained ; the manures from well kept cattle being far more valuable than that from those which are poorly attended to. All the urine of animals should be preserved when possible, as this is very rich in nitrogen and the phosphates, and some writers on agriculture maintain that its value if properly preserved and applied is greater than that of the dung. From an experiment made a short while ago, it appears that in five months each cow discharges urine which when absorbed by loam, furnishes manure enough of the richest quality and most durable effects for half an acre of ground, there are various methods by which this manure might all be saved if the intelligent farmer will only set his wits to work in a proper manner. One simple way which I have observed, is to obtain a supply of soil in dry weather and to store it away in some shed or outhouse, and use it as an absorbent under the bedding, removing the soil to the compost heap as often as it becomes necessary. But the waste of manures is not confined to those of the liquid form : stable manure is often left exposed to the action of the weather and to ferment until the greater portion of its most valuable elements have disappeared, and as it is always desirable to retain these fertilizing elements, it should be sheltered from the sun and rain, and fermenting heaps so covered with turf or loam, as to prevent the escape of the fertilizing gases.

While referring to animal excrements, we are not forgetting the fact that the great bulk of such manure as is generally to be had is straw. Nevertheless the value lies chiefly in the excrements ; and the chief value of straw is to keep these together and to retain the urine till it is absorbed by the roots of plants and the several salts as they become soluble, thus preventing their loss from being filtered away by rains.

The manure of all poultry should be carefully preserved, as it is extremely rich in nitrogen and the phosphates. Professor Norton says that one hundred pounds of this material that has not been exposed to the rain or sun, is equal in value to five or six loads of stable manure. It must be kept dry, reduced to powder and applied as a top dressing, or else formed into a compost with some matter to act as an absorbent.

The flesh of dead animals, and the blood and offal from slaughter-houses are among the most powerful of fertilizers ; and yet it is not uncommon to see horses or cattle that die from disease drawn out in the woods or fields to decay on the surface of the ground. Every animal that dies should be made into a compost at once by covering with a few inches of turf or loam, as by that means decomposition goes on without the loss of the fertilizing elements, and a manure of the most valuable kind is produced.

The value of bones as a manure is undisputed, and they are beginning to be appreciated as they deserve to be by our farmers. They contain some of the most desirable and efficacious of the fertilizing elements required by plant life, and no thoughtful gardener should suffer them to be wasted about his house. One simple way of making bones available as a fertilizer is to take sulphuric acid and dilute it with three times its bulk in water ; then place the bones in a tub or barrel and pour in the acid as diluted upon them. After standing a day another portion of the acid may be poured on, when they will be found to be dissolved into a kind of paste, which is best applied by mixing thoroughly with earth, ashes, dried muck or some such matter.

Sewage as a manure is far too much neglected. We are hearing continually of the tremendous loss caused by our waste of town sewage. We leave that to those whom it most concerns, with the passing remark that it says little for the state of our political economy to waste that which, if properly applied, would produce the food that is brought from long distances at a tremendous annual cost. Of the waste of sewage in this country, I can only speak as others have spoken—in condemnation. As I pointed out when speaking of human excrements, house sewage contains the inorganic food of plants in such a percentage as to make it available for any crop. Every house to which a garden is attached should have a tank into which the sewage would run and accumulate, and this as a manure water would prove invaluable. Sewage as it comes from the house, is equal to guano water ; and where there is labour power enough, and the article convenient, its application would tell greatly in its favour, as we have abundantly proved. In quantities, it causes a luxuriant tender growth amongst such things as Cabbages, Cauliflowers, (causing the latter to throw

fine heads) and indeed among succulent crops generally. Lettuces and other vegetables fed with an abundance of sewage on thin hungry soils, are always much more juicy, tender, and crisp, in addition to having twice as large a crop.

VEGETABLE MANURES.

GREEN MANURING—Vegetable substances in their green and succulent state are powerful fertilisers when thoroughly incorporated with the soil. A great portion of the bulk of green crops is obtained from atmospheric sources; and after a green crop is ploughed in, the soil necessarily contains more of the organic elements essential to vegetable nutrition than it did before that crop was grown; it is richer, in fact, by the carbon, oxygen, hydrogen and nitrogen, which the green crop has obtained from sources independent of the soil. In like manner, the crop grown after a green crop has been ploughed in, has the advantage of a regular supply of mineral elements which have been worked up by the roots of the fertilising crop from the soil and sub-soil, and which, in many instances, owing to their sparing solubility, are with difficulty obtained under ordinary circumstances.—*Morton's Cyclopaedia* “The advantages of green manures ‘consist mainly in the addition of organic matter which they make ‘to the soil. This matter aids in the liberation of those mineral ‘ingredients which are there locked up, and which, on being set free, ‘act with so much advantage to the crop. The roots also exert a ‘great power in effecting this decomposition, and their agency is far ‘more efficacious than the intensest heat or the strongest acid in per-‘suading the elements to give up for their own use what is essential ‘to their maturity and perfection. By substituting a crop for a ‘naked fallow, we have all the fibres of the roots throughout the field ‘aiding the decomposition which is slowly going forward in every ‘soil.

‘The proper time to turn in all crops used as a green manure is at ‘the season of blossoming, as in the green state the fermentation is ‘rapid, and by resolving the matter of plants into their elements, it ‘fits the ground at once for a succeeding crop. Straw, leaves and ‘vegetable are readily decomposed by the addition of a small quan-‘tity of animal substance, or lime, and should be carefully compost-‘ed, as they will add very much to the quantity of nutritive matter ‘collected under the form of manure in a year. Turf, muck, mud, ‘the cleanings of old ditches, etc., are very rich in vegetable matter, ‘and are exceedingly valuable to the farmer for use in composts, and ‘should be much more used and appreciated than they are now.

MINERAL MANURES.

Mineral manures include lime, salt, ashes, etc. These are very useful in supplying any inorganic matter that may be required to

improve the fertility of the soil, and are also very valuable to improve the condition a soil may be in.

Lime is applied to land in three different states—as quick lime, slaked lime, and mild or air-slaked lime. To cold, stiff or newly-drained land it is best to apply quick or slake lime, while on light soils, mild or air-slaked lime is most beneficial. It is best to apply lime frequently and in small quantities, so as to keep it near the surface and always active.

Common salt has been in use for ages as a fertilizer, and its great value cannot be disputed. As an ingredient in compost it is invaluable, and operates on the soil with an influence which can be produced by no other stimulant, mineral or vegetable. It is very beneficial as a top dressing for wheat and grass lands, especially those of loamy texture.

Ashes are composed of the entire inorganic parts of plants, and their great usefulness as a manure is evident and undisputed. The ashes from different trees differs materially in composition and value, but all are highly useful applications to every kind of soil and crop. Coal ashes are less valuable than wood-ashes, but are by no means to be neglected by the gardener, being very useful, especially on stiff soils.

Among the most common and most valuable of special manures, I place wood ashes," says Professor Kedzie. "The amount of ash and its relative composition vary with the kind or part of vegetable burned, but we may safely take the ash of the body of a beech tree as representing the average composition of wood ashes. One bushel of ashes represents about two-and-a-half tons of dry body wood. Wood ashes contain all the required elements of plant nutrition except nitrogen. One hundred pounds of wood ashes contains 16 pounds of potash worth 80 cents, $3\frac{1}{2}$ pounds soda worth 2 cents, 67 pounds of lime and magnesia worth 8 cents, and $5\frac{1}{4}$ pounds of phosphoric acid worth 26 cents. If we had to buy in the market the cheapest form the manurial materials contained in 100 pounds of ashes, the cost would be \$1.16. Can you afford to throw away such valuable materials, or sell them for sixpence a bushel to the soap-boiler? No argument is needed; here is the value and there is the selling price. Draw your own conclusions."

CHARCOAL.—Charcoal is made into an excellent manure by absorbing from the atmosphere, or the earthy substances with which it comes in contact, ammoniacal vapours and saline solutions which are very beneficial to vegetation, and without which they could not live. Now wood charcoal, (for there are two sorts, wood and animal) as it is very light and porous, has great affinity for vapours, absorbing a large amount of ammonia and $9\frac{1}{2}$

of oxygen. Ammonia is present in, and is given off from, all dead and decomposing animals and vegetables. It is also one of the chief constituents of manure, without which it is almost worthless. Wood charcoal also possess deodorising, disinfecting, and decolorising properties, which are entirely dependent on its absorbent qualities. Seeds sown and plants grown in moistened charcoal, sprout and grow with remarkable quickness. The best way to use charcoal is to mix about half and half with manure, or to carry the urinal water of stables and cowsheds and empty it on to a heap, or even let it steep in water from the dung heap, so that it may collect and retain the salts and solutions which are necessary for the well-being of the future plants. There is also another very valuable fertiliser, but which must be used with caution or it will do more harm than good. This is soot, which contains from 18 to 48 per cent. of mineral matters, which are found in combination with it, consisting of the earthy matters of coal and of compounds of gypsum and sulphates which are obtained from the lime of the flue and the sulphur of the coal. It also contains from 1 to 5 per cent of ammonia ; these compounds are for the most part very soluble, and enter into the composition of almost all vegetables.

GARDEN REFUSE.

THERE are few gardeners, perhaps, that will not candidly confess to a weakness in favour of ample supplies of manure and composts or soils ; and equally few that willingly cry enough of either, even when they are best served. Like the other good things of horticulture, these are not very evenly distributed. Some much-to-be-envied individuals appear to wallow in their abundance of these essentials to good gardening ; to many others it is a constant struggle to get the means to accomplish the end in one or other or both these matters. Much scraping and collecting together of everything that is likely to be useful in eking out and taking the place of the limited but more valuable stores in hand has to be undertaken periodically as the usual lot of pinched means ; and only those who have some experience in this line can realize what is meant and entailed by this work of scraping and collecting together materials for composts. It means makeshifts and substitutes often inferior in character and efficiency ; it entails an increase of labour rarely taken into account, and that can only be justified by actual necessity ; and it entails often an amount of anxiety and vexation on the gardener that only his devotion and enthusiasm can enable him to endure. All these considerations point to the necessity of utilising everything in any way fit to be converted into substitutes for manure or the better class of soils, at little cost of labour and time.

Among all matters that may be so converted into manure and soil there is perhaps nothing more available and useful than vegetable or garden refuse. Composed as it is of the remains of the used-up crops of the kitchen garden, the exhausted occupants of the flower garden, whether in the shape of stems, leaves or flowers of perennials and annuals, the mowings and sweepings of short grass, charred weeds and prunings, and the miscellaneous accumulations of decomposable matter that result from the operations necessary to the dressing and keeping of gardens, it must, at least, be admitted to be varied enough as regards components. I have an impression that more might be made of garden refuse than generally is the case in most places. I have met with very few cases in my own experience where the principle of saving and storing every particle of it was insisted on as a part of the general management of the garden. In some cases it may be unnecessary, owing to the requirements in manure and soil being easily supplied from better sources; yet even in such cases I would ask whether, on the score of economy, the matter in question should not be saved. There need be no fear that it will not come in handy and useful. Compost of this kind is of the greatest value in the planting of shrubs and trees, especially in cases where they must be put in ground that has been occupied previously by similar subjects. As dressings for flower beds and borders it is superior to manure, and for many vegetable crops, such as Saladings and Turnips, we find it almost equal to manure. In my own case I am by no means stinted in manure supply, nor in compost soils either, but for many subjects, they are easily improved in quality and texture by additions and mixtures from the compost heaps; I find also that I have greater command of soils for composts, both in variety and quantity, from the habit of saving the refuse.

So much for the uses of garden-refuse and the ways of disposing of it about larger gardens, in a brief way, and now a word respecting its use in smaller ones. It is in these latter that the benefits of carefully husbanding in matters of a decomposable nature will be most felt. By small gardens, I mean those where all manorial and compost matters must be purchased. I would urge on all possessed of such gardens, the importance of saving every scrap of green and dry refuse that may be reduced to compost within a reasonable time. In the garden or out of it, on the premises or beyond them, let all matters capable of being reduced to plant-food by means of fermentation or fire, be drawn together in one place and frequently turned. Two heaps may be advisable—one for gross materials, those which having much woody fibre in their composition, will require to be treated to liberal applications of quick lime, and the other for leaves of all kinds and the remains of herbaceous stuffs generally; in fact, everything that will ferment of itself may be put on this heap, and each

successive addition should have a little quick lime mixed with it for the purpose of combining with and fixing some of the gaseous constituents and promoting the decomposition of the woody particles. Some attention given to these points, and to the desirability of adding to the heap or heaps on every favorable opportunity, will have the effect of lessening the expenses of the garden in the first place, and will afterwards lead to the improvement of the soil. The kind and quality of manure that is generally purchased for gardens of the description contemplated, is usually of a heating and stimulating kind, under which few soils can long remain equally productive. They are especially unsuitable for thin dry soils, whereas the compost is the best application that can be made to such. In a few years it sensibly increases its depth and annually adds to its productiveness. The compost will sustain excellent crops of all kinds of vegetables which, if not so luxuriant as those from manure at first, will be more sweet, crisp and firm.

An American writer gives the following practical instructions as to the method of utilising refuse to the best advantage "What is a compost heap ? Properly made, it is a heap of manure, a repository of all kinds of otherwise obnoxious matter, which it converts into harmless and most valuable plant-food. I say properly made, for there are heaps and heaps, and it is rare to find one so built that its contents will decay well, or one not surrounded by valuable liquid which is too often allowed to run to waste. The heap is often thrown up anyhow for its materials to dry instead of rot, and much of its value is lost in that way. To make a proper compost heap there must be a fair proportion of stable manure. Having that at command, first dig out an oblong trench in a convenient situation. It may be eight by twelve feet for a garden, and twice or three times the size for a field. Throw out all the black soil, down to the clay, upon one side, leaving the other clear for wheeling or carting alongside. Commence with a layer of coarse stable dung, about six inches thick, spreading it evenly over the bottom. Then build up, layer by layer, evenly and flat, with the clearings of hedgerows, ditches and grassy walks, weeds of all kinds (unless going to seed, when they should be burnt), lawn mowings, leaves, pea and or bean stalks, etc., in fact, anything which will decay. Always shake all the stable manure and green stuff to form an even layer, never leaving so much as a barrowful in one spot. Build up the sides as plumb as the walls of a house. Between every three or four layers of manure and green stuff throw a sprinkling of the earth taken out, to prevent heating too much, or a dressing of ashes, if at hand. Deposit here all the kitchen or house waste (old boots or tin cans excepted), and the droppings from the fowl-house. Break up any lumps in the hen manure, or better still, throw dry earth under the roosts. After every layer of stable dung, or green stuff, tread it down

' well, and so go on, adding layer by layer, but never more than four or five inches of any one kind. Should there be rather more stable dung than other materials, throw over more soil, which will absorb the moisture and assist in the decomposition. Scratch the sides down with a fork, leaving it as neat as a stack, but with a flat top, and when about four feet high, cover all with a layer of three or four inches of soil to keep in the ammonia. After the heap has been allowed to heat for a week or so, throw over it the liquid waste from the house, etc., and if any liquid should run from the heap, dig a hole at the lowest corner to catch it, and throw it back over the top. Of course, if pigs and cows are kept, the mixture will be all the better. In about three or four months, the whole will be found in prime condition for any kind of crop. A heap of this dung should always be under way, in order to dispose of all waste or decaying matter, allowing the garden and surroundings to be kept in much better order. Whenever the heap gets about four feet high, top off with a layer of soil and start another. 'Method makes money.'

LIQUID MANURES.

The advantages of applying manures in such a form that they may be readily absorbed by plants, instead of laying inert in the soil for months, as is frequently the case when solid manures are used, should certainly be known to every one interested in gardening. In Europe the practice of using manures in a liquid form, especially for plants in pots, has been adopted extensively for years, having in many instances entirely superseded all the solid substances formerly used as stimulants. In this country, except in very rare instances, the old practice is still adhered to. Liquid manures, except in the hands of the professional gardener, continue unknown or at least neglected; this is the more surprising when we take into consideration the enervating climate, the innumerable insect pests and the thousand and one other ills to which our most highly prized favourites frequently succumb, and which, in many instances, would undoubtedly be saved by a judicious administration of some stimulants that would induce them to start freely into growth. The following interesting remarks on this subject recently appeared in *The Garden*.

"One of the common mistakes made by amateur cultivators of flowers is that of over-manuring. To grow plants properly, little or no crude manure should be incorporated in the soil, as it induces a too luxuriant growth of foliage and wood at the expense of the flowers. The liquid form is the best in which to apply manure, and this should be made very weak, especially if it be of a stimulating character, such as guano. The chief value of liquid manure is that its effects are perfectly controllable, and can be made constant either to produce an exuberant growth and sustain it, or to produce

any lesser effect, as may be desired. If wood and foliage be desired the manure should be given as soon as the buds begin to swell or when the leaves commence to develop. This growth can be kept up during the season by frequent applications of the liquid, but should never be continued beyond the 1st of August, as then the growth naturally begins to cease, the wood begins to harden as the season advances, and ripens for the winter rest of the plant. If the liquid be applied after the commencement of this preparation for rest, the growth is unnaturally continued, and the wood, not having time to ripen, is winter-killed. When the production of fine flowers is desired, liquid manure should be applied when the flower-buds begin to show themselves prominently and commence to swell; it then causes a larger development of the petals and a enhancement of the colours, but if applied too early, it is liable to produce monstrous flowers.

Applied to Roses, the flowers are largely increased in size and also in brilliancy of colour. For Zonale Geraniums and similar plants, the supply must be moderate and continuous; while to plants bedded out for their peculiar foliage, it should be given more frequently, so as to cause the production of larger and higher-coloured foliage. With some plants, however, such as bulbs, the strength of the flowers is dependent upon the luxuriance of the leaf growth of the previous season, the results of their vital action being stored up in the bulb for next year's blooming. In such cases the plants should have a supply of the liquid for some time after they have done blooming. When applied to fruit trees, the best time for its application is after the fruit has set and it begins to swell. To give it when the flower-buds show themselves is useless, as the size and colour of the flower have little if any influence upon the size and flavour of the fruit. If the manure applied be too strong, a too luxuriant leaf growth is brought about, and there is danger of the tree casting its fruit prematurely, the whole energies of the plant under the stimulating action of the manure being expended in the production of leaves. As the season for the maturing of the fruit approaches, the supply of manure should be gradually withheld, or otherwise the fruit, although large and fair, would become watery and lose much of its proper flavour. The best mode of applying liquid manure to plants or trees in the open ground is to make holes near them, or towards the extremities of the circle to which their roots extend, with a crow-bar or stout stake, from 1 to 3 in. in diameter, driven in to a depth of from 12 to 18 in., and then withdrawn, filling the holes with liquid. It thus soaks away into the soil immediately in contact with the roots, and nothing is lost by evaporation, as is the case when it is applied to the surface of the soil. This is also an admirable mode of watering plants in the open ground during a drought. The number of these holes should vary with the size of the tree.

' or plant, one hole to every 2 ft. square of ground being generally sufficient. If the weather be very dry, the manure should be much diluted ; and if the weather be wet, it may be applied of greater strength. As a rule for the preparation of liquid manures for outdoor purposes as above recommended, the following quantities of various manures to a hogshead of water (sixty gallons) will give the average strength at which it should be used, if applied every two weeks during the season :—One bushel of horse manure, or the same quantity of sheep manure, or half a bushel of hen manure or half a bushel of soot, or six pounds of guano, allowing the liquid to stand two or three days before using, stirring it once a day, and using the clear liquor."

SOOT WATER.—As a cheap and easily made reliable fertilizer this is of great value. It may be used with much advantage wherever plants are grown in pots. There is no kind of plant it does not benefit, and it may be given to those which produce fruit, flowers, or fine foliage. It has the virtue better than any other fertilizer of clearing worms from the soil of pots, and this is a great gain in itself. No kind of worm will remain in the soil which receives a supply of soot water occasionally, and it causes foliage, fruit, and flowers to assume a much darker colour than they do when it is not used. It imparts extra vigour, and may be used all the year round. Ferns are specially benefited by it, and the fronds assume a deep green colour under its influence. It may be used to expel worms before the pots are full of roots, but as a general fertilizer it should not be much employed until the roots have taken to the soil freely. It is not wanted until then. Many have much difficulty in getting the soot to mix with the water, but this is easily enough managed. Any ordinary old bag should be taken; half fill it with soot, put a brick or large stone inside, tie up the mouth, and put into the tank or barrel with the water. In a short time the water will have penetrated through every particle of the soot and converted it into a pulp. The water is then in excellent condition for use. It may, however, be too strong for giving to the plants as it is, but a quantity of it may be lifted and put into the pans with clear water, the strength to apply it being a matter which can only be determined by the cultivator.

ARTIFICIAL MANURES.

Purely chemical manures are usually classed by those who know but little of the subject, as stimulants, but a stimulant is something which causes temporary excitement, but does not produce any permanent good.

To the human race alcohol is called a stimulant. We hear of old people being sometimes kept alive by the aid of stimulants,

but never of young people growing and thriving on them. Sir J. B. Lawes says: "Light and heat are the only stimulants to vegetation, all other things must be classed as foods." Therefore chemical fertilisers are not stimulants, but real plant foods.

Commercial fertilisers, like potash salts, phosphates, bones, guano, ammonium salts, and nitrate of soda, contain plant-food in very concentrated and readily available conditions. Their principal ingredients are phosphoric acid, potash, lime and nitrogen. The rule in purchasing such manures should be to select those which supply most economically the materials that garden plants need, and which the soil fails to furnish in sufficient amount.



CHAPTER VII



Seeds and Seed Sowing.



THE proper selection of Seeds is undoubtedly the first step on the road to success in gardening, it may therefore not be inopportune to offer a few observations on *seed selection*, for there are some very unsound ideas far too prevalent, which often lead to injudicious purchases. In the opinion of a large number of persons, seeds are a purchasable commodity of like value from whomsoever obtained. No more delusive idea exists. If one thing is more certain than another it is this: that there is as much difference in seeds as in men and women, and consequently it behoves every one to get the best obtainable. There may be some trifling difference in price; the good will undoubtedly cost rather more money; but what is that circumstance compared with paying a trifle less and getting an inferior article? Satisfactory crops cannot be grown from inferior seeds, however good the cultivation. Good seeds must be secured, then, whatever the cost and trouble in selecting them.

The sage advice in one of our famous cookery books, which commenced with the admonition "to first catch your hare," may be paraphrased on the present occasion by the advice "first select your seeds." Any one who has paid a moderate amount of attention to matters horticultural, must know that during the last few years great improvements have been made in most of our vegetables, and in many flowering plants raised from seed. For example, compare the Cabbages of to-day with those of ten years ago, or the Peas, Broccoli or Cauliflowers. These marked improvements, small from year to year, but important over longer intervals, we owe chiefly to our leading seedsmen, who have spent great pains in the creation and improvement of so many plants of every-day use. In numbers

of instances they have done the work in their own grounds ; in others they have bought up at large premiums the results of other men's labours ; but in one way or another it is to the enterprise of our leading English seedsmen that we are indebted for the improved characters of so many universally grown plants.

Then it must be remembered that these enterprising members of the craft, however enthusiastic they may be, and we believe that many of them are enthusiastic to a degree not common amongst business men in other trades, have to regard the distribution of their seeds, however good they may be, as a commercial transaction and if they are to thrive, they must contrive to gather a little profit by the way, or they will fail in their object. In what way, it may be asked, does this consideration affect the seed buyer ? The answer to this question will appear a little later on. It must be conceded that every real improvement effected in any plant of general use, is a national gain. It is equally a personal gain to the individual cultivator. Each gardener has thus, it would seem, not only a personal, but a collective interest in these improvements. And again, if these seedsmen and the other raisers of improved seeds are repaid for their past labours they are encouraged to undertake others, which in turn will benefit the general community. This can only be secured by a very large number of persons buying the novelties which are offered from year to year. There is a frequent notion amongst gardeners that it is hazardous to buy novelties. Perhaps it was so when ill-advised people offered untried things for sale ; but now-a-days, what with criticism in the Gardening Press and the care which good business men take to prevent disappointments, the risk is reduced to a minimum.

It is rare that any strongly recommended novelty will now prove absolutely delusive. I may then, without indiscretion, urge our gardeners to be trustful as well as careful, only suggesting that in selecting novelties for trial, they should do so judiciously by choosing those only which are sent forth by well-tried and trustworthy firms.

I cannot too forcibly impress on my readers this fact, that the pedigree of seeds is as important as the pedigree of stock. If a celebrated breeder of shorthorns by his skill and perseverance through long years, has obtained a strain of animals superior in some respects to all others, and so commands a higher price for his produce, why should not our seedsmen, who have taken equal pain, equally reap the reward of their labours and enterprise ?

SEED SOWING.

The sowing of seeds is too often looked upon as an operation requiring but little care or attention, and especially so by the native *malee*. When the sowing is left in his hands, he cannot

realise that any difference should be made in the treatment of large or small seeds : his only idea seems to be that all that is required of him is to scatter the seeds either in a seed-bed or pot, as the case may be, cover them with a certain amount of soil, (in the majority of instances far too much) and leave the rest to nature.

If there is one operation more than another that the owner of a garden should personally superintend, it is the sowing of seeds, not only to see that the work is properly done, but also to insure proper seeds being sown ; for it is a very common trick amongst *malees*, when the sowing is left entirely to them, to purloin the seeds given them to sow, and substitute others of an inferior description in their place. A great diversity of opinion exists as to the proper method of sowing seeds. Many of our leading Horticulturists at home advocate the practice of sowing in an almost perfectly dry soil, and others as strongly urge the necessity of thoroughly saturating the soil before sowing.

We next come to the question as to the proper extent of covering to be given to the seeds, and on this point there are also many conflicting theories, some advocate covering deeply, and others, scarcely covering at all. If we err at all, it is better to do so by covering too little, rather than too much. The worst danger to be apprehended is that the seedlings may come up rather weaker than they would if they had a firmer hold on the soil. We must remember that all covering is, to a certain extent, unnatural ; plants in a state of nature distribute their seeds on the surface of the soil, and although these before germinating may become covered with leaves or other débris, this is the result of accident and not design. On the other hand, thousands of seeds are buried alive—suffocated, through excess of covering. The soil in which seeds are sown should be made moderately firm, if too hard, it will prove an obstacle to vigorous growth ; nor must the soil be left soft, a certain amount of resistance is necessary for the healthful development of the plants.

SOWING SMALL SEEDS.—Nothing perplexes amateurs and others, who are not well acquainted with gardening, more than the raising of plants from seed. To get up large seed is an easy matter, but not so in the case of small seeds, as they require very careful sowing and management, or failure is sure to be the result. Take Calceolarias for instance, or Begonias, the seeds of which are as fine as dust, and sow either in the ordinary way, and the chances are that the whole will be lost ; whereas by preparing the soil properly and sowing on its surface, both kinds of seed germinate freely. First drain the pan or pot, and then put over the crocks some moss or rough siftings from the potting bench, and on these some of the finer soil, finishing off on the top with very fine sifted soil mixed with a little silver sand. All should then be pressed down

and made level and smooth, and then watered through a fine rosed pot or damped by means of a syringe, when, after standing to drain for a time, all will be ready for sowing.

HOW TO SOW VERY SMALL SEEDS EVENLY ON THE SURFACE OF THE SOIL—Many find it difficult to do this; some advise mixing the seed with sand, but that does not help much. I have found the following plan perfectly successful. Take a piece of writing paper about the size of an oblong letter envelope, or better, perhaps, an envelope itself, bend it slightly so that the upper surface may form a hollow channel; place the seed in this channel, about midway, then hold the paper by one end in the left hand, the thumb on the upper surface, the lower surface resting on the fore and middle fingers separated from each other, the channelled form of the paper being thus maintained. Then incline the other end of the paper slightly towards the surface of the soil on which the seed is to be sown, and with the forefinger of the right hand give a succession of gentle taps on the thumb of the left; this action will cause the the seed to pass gradually down the paper, and over the lower edge, as sparingly as may be desired by properly regulating the force and frequency of the taps, and so the seed may be sown as sparsely and as evenly as you may desire. I can thus make even the minute seed of the Tuberous Begonia fall on to the soil almost singly. The lower edge of the paper must be smooth and even, otherwise the passing of the seed over would be checked; this is best secured by using an envelope, this part of the work over, the next thing to provide against is the seed suffering from want of water, or the soil getting the least dry, as that is a rock beset with failure. To prevent the soil drying, nothing answers so well as a piece of glass laid over the pot or pan, as it keeps the air in a thoroughly humid condition. A bell or hand-glass answers the same purpose if kept close, and in sunny weather it is always advisable to shade, as solar heat and light soon draw out the moisture. Should the soil become the least dry, the safest way to damp it, is to bedew it with water from a syringe, as it can be done more lightly than through the rose of a pot, if the syringe is used with dexterity. Seeds of a larger size than those named may be slightly covered or have a very thin sprinkling of fine silver sand amongst them, but only just enough to give colour, and not bury the soil. Seed the size of Mustard may be buried the eighth of an inch deep, and so on in proportion, but the great point with all to secure free germination is to have an equal warm, moist bed, from which they come forth without any loss.

GERMINATION OF SEEDS.—Many and various causes tend at times to retard the growth or germination of seeds, as, for instance, too much wet with too low a temperature; and, as is often the case with small seeds, their being covered too deeply. One of the greatest sources of failure, however, consists in sowing in ground

but freshly broken up, or too loose and open, and not sufficiently firm to retain an even moisture,—a condition which is of the first importance in the successful rearing of all kinds of plants from seed. Freshly dug, or very light and loose soil, when seeds are sown in it near the surface, very often contains but just sufficient moisture to start the germ of the seed into growth; and if the weather is at all dry, as frequently happens, this surface moisture rapidly evaporates, and the soil becoming dry below the seed, before the young root has had time to push its way down, the embryo plants at once perish, and the seedsman is but too often held in fault for needless failure. Unless very heavy or clayey, the ground in dry weather cannot be made fairly too firm for seed sowing, and whether sown in pots, pans, or boxes in the greenhouse, or on seed-beds, etc., in the open ground, a firm bottom should at all times be secured. In sowing seeds out of doors, freshly broken-up ground, if of a heavy or retentive nature, should be made more firm by beating down with a spade, &c; if very light and open, it should be trodden down firmly with the foot, and in either case raked level before and after sowing seed. This process will ensure an even and moist surface, a free germination, and, in very many instances, serve as a preventive of unnecessary disappointment.

SEED SOWING IN DRY WEATHER—To obtain a regular succession of many things, both flowers and vegetables, it is necessary to sow frequently. In a well managed garden, although the bulk of the main crops are sown during September and October, still to keep every yard of land constantly employed, seed sowing must be a continuous business almost throughout the year. During the months abovementioned this is a very simple matter, for the soil is then moist and friable, in fact too frequently overcharged with humidity. As the season advances, this gives place to a continuous period of drought and it is at this time that the difficulties of the gardener commence. In most instances seeds that are sown obstinately refuse to germinate owing, of course, to the want of sufficient moisture in the soil; and even when they do make their appearance above ground, they are generally so weak and sickly that they either wither off at once or become the prey of the first insect pest at hand. The first remedy for this state of things is to thoroughly saturate the seed beds with strong liquid manure before sowing. If no animal manures are available, Guano, at the rate of one ounce to the gallon of water, answers equally well. Sow the seeds immediately, covering with dry soil only; treated in this way the young plants come up strong and vigorous, and get away from insect enemies at once by their rapid growth.

WHY SEEDS FAIL—An American writer on this subject very pithily remarks that “when purchased seeds fail, the seedsman is blamed. If seeds do not produce a crop true to kind, the fault is probably that of the seedsman, or rather of the seed grower; but

when seeds fail outright, the fault is generally that of the one who sows them. Entire failure with seeds is usually due to one of two causes : to too deep covering, and to improper covering. When the seedling plants appear above the surface of the soil, the growth made in doing this is entirely from the contents of the seed. The stem of the minute embryo, the rudimentary plant, elongates, a portion pushes downwards into the soil, and another pushes towards the surface of the soil. The material for this growth was provided beforehand in the seed itself, either in the seed leaves of the embryo, as in the cucumber, or outside of the embryo plant, as in the beet. This growth takes place before the plant has formed any roots by which it can take up nutriment from the soil. It is evident, if the seed be so far below the surface that the material provided for the growth of the young plant is exhausted, before that reaches the surface, it must die. Hence, covering too deep is a frequent source of failure. If the seeds are but slightly covered with very loose soil, the embryo plant, after it starts, is in contact with the air, which fills the spaces between the particles of the soil and soon dries and dies. This common cause of failure may be avoided, by compacting the soil, bringing its particles in close contact with the drying air. Hence compacting the soil by the use of a roller, by patting the surface with the back of a spade or by the old method, rough, but effective, of 'treading in the seed' by passing over the rows with the feet, either of these, which produces the same result, will ensure success with seeds which otherwise would fail. These are most important points to be heeded at sowing time.



CHAPTER VIII.

The Cultivation of Plants in Pots.

SUCCESS in gardening, as in affairs of greater consequence, is mainly dependent upon careful attention to a variety of little matters—too often considered of minor importance—and in no portion of the work of the garden is this careful attention more needed than in the cultivation of plants in pots. It is not a good plan to grow any plant in a pot; but pot culture is a necessity of horticulture, and as all gardeners, great or small, grow an immense proportion of their stock in pots for a shorter or longer season every year, it follows that they should know all they can about pot culture and its evils. Gardeners, and especially amateurs, are so much accustomed to growing plants in pots, that I dare say that the idea is a common one, that it is the best way to grow them. It is not the best way, however, and except under a few exceptional circumstances, it is the worst way. Very many of the ills which afflict plants are directly or indirectly traceable to their culture in pots. It is an acknowledged fact that green-fly, thrip, red spider, mildew and not a few other pests and diseases which attack plants, are encouraged and aggravated by culture in pots. How is this? some one will ask; and in answer it may be said that the idea is not a new one, or broached for the first time. Lindley gave the subject his attention, and so did Knight; and inventors have devised pots that were said to overcome or mitigate the evils complained of, but owing either to the price or inconvenience of using such articles, they have never become popular, and for mostly all purposes the common flower pot is still in general use.

One of the greatest disadvantages connected with the use of pots is the necessity of standing them in places exposed to the air and sun, and the great fluctuations of temperature and

moisture to which the roots of the plants growing in them are exposed. It is very bad for any plant to have its roots in a medium that is liable to be alternately wet and dry, or cold and warm, and these are just the conditions to which pots expose them ; hence experienced gardeners are always casting about for some means of protecting the pots, and resort to plunging, shading, sprinkling paths, and various other devices so as to prevent these agencies working mischief as much as possible. When a plant is newly potted in abundance of soil, and freely watered, the roots are not so much affected ; but when they reach the sides of the pots, which they soon do, and there is nothing between them and the sun and air but about an eighth of an inch of porous earthenware, they are liable to serious injury if not watched attentively. When the soil becomes parched in the pots it shrinks away from the sides, leaving a space between the two ; active evaporation begins from the tender roots, which instead of absorbing moisture, as is their function, part with it, and the consequence is that they are either killed or injured, and the branches suffer in proportion. Where large collections of plants exist, or where those in charge have not time to attend to the wants of the plants, this is quite a common occurrence, and many a plant is irretrievably ruined thereby. Regular attention to watering and shading can only prevent such things happening ; and in the case of pot-bound plants a good deal of attention is required, because the soil in the pot soon dries up. To fully understand the condition of a plant situated in a pot as described, it must be remembered that in the natural state when a plant grows in the ground, the roots have unlimited scope, and do not experience such conditions at all ; whereas in a pot exposed on all sides, evaporation is constantly going on from the roots, the porous earthenware pot acting like a wet cloth put round a bottle of water to keep it cool. As regards temperature, the roots of all plants are naturally subjected to far more uniform conditions than the tops, that is to say the temperature of the ground does not vary nearly so much as that of the air, and it is found that the nearer these conditions are imitated in artificial culture the better do plants thrive.

The remedies for the drawbacks of pot-culture are various. Many kinds of plants have of necessity to be grown on stages and shelves in houses where they cannot be plunged, and the cultivator must then do the best he can under the circumstances. The main point to attend to in such cases is not to water the plants during the driest and warmest time of the day when evaporation is most active, but say in the morning or in the evening. Plants standing with their pots touching each other thrive much better than when the pots are placed widely asunder, and hence close ranking should be the rule, provided the tops have room at the same time. Under other circumstances the best plan is to plunge

the pots up to the rim, whenever possible or convenient. Plunging obviates many evils, and it is often a good practice to plunge the pots of favorite subjects in another and larger pot, filling up the space between the sides with ashes or soil. Double-sided pots have been made to meet this end, but they are too cumbersome for general use. A dry cloth or a piece of stout brown paper tied round a pot, answer almost as well. The object in any case is to prevent radiation and evaporation, or the escape of heat and moisture from the soil in the pot, and so preserve the roots in an agreeable medium.

This system of growing plants for out-door decoration is much more generally practised in this country than in Europe ; and where but a limited space is available, when intelligently carried out, is perhaps the most efficient method of beautifying and adorning our homes. By this means we are not only able to grow a larger number of plants in a given space, but, provided they are properly looked after, will always present a neater appearance than when planted in the ground.

The first point to be considered is the proper selection of varieties, and where, as in this country, we have such a plethora of beauty to select from, this is at times rather a difficult task ; for we must bear in mind not only whether the situation they are to be grown in is fully exposed to the sun—partially or entirely shaded—but there is also the question of size, which must be regulated according to the position they are required for. If the plants are to be arranged in straight lines, they must be selected of uniform height for each row, but if intended to be grown in groups, they should be placed in pyramidal form. The same regularity must be observed in the choice of the pots in which they are to be grown.

Then, as to their proper arrangement. To do this successfully great care and good taste is necessary. The common practice of grouping a lot of highly coloured foliage plants together, without anything to subdue or harmonise the effect, reminds one of a bouquet of dark roses without either foliage or any other colour to relieve them. Take the same flowers and add a small number of either yellow or pink varieties, with a fair amount of foliage, and mark the difference in appearance, and in the same way with plants, if highly coloured varieties are judiciously blended with others having deep green foliage, such as Palms, Cycads, *Panax*, &c., the effect will be greatly improved.

COMPOSTS FOR POT PLANTS.

ONE of the most important matters connected with the cultivation of imported or acclimatised plants,—which have in this country to be cultivated mainly in pots or restricted borders,

frequently under glass or carefully shaded houses, and have, as a consequence, to be constantly supplied with water by artificial means—must always be the constituents of the soil in which they are potted or planted. Although certain plants—the Croton for instance—appear to be not over particular as to what description of soil is used as a basis for a compost, yet even such plants attain to different degrees of health and vigour when the soil most suited to their nature preponderates. Good culture in all other respects lessens the evils arising from a misapplication of soils; but when a plant finds its element in this respect, and is otherwise properly cared for, its character is developed with more freshness and vigour.

I believe it is correct to say that the chief features of the horticulture of the present, as compared with that of the past, is, that complicated mixtures of soils and manures are less used and believed in as "the secret" of successful culture, and that the tendency is still in the direction of simplicity in this respect. Mixtures when compounded from fancy, and with little knowledge of the elements of chemistry, may or may not be compounds of evil. After many years of extensive practice, I am thoroughly convinced that the mixing of different sorts of soils and manures for potting plants in general, is an evil to be avoided, and feel certain that a plant that thrives in loam will thrive better in it ultimately—make a more healthy and robust plant—if there are no animal or organic manures mixed with the turfey loam. I of course mean all organic manures of a rapidly changing character which putrifies, even though in that process the substances formed are highly important to plant life. All such, and humus of every description, are best left out of the soil in which all the slower growing and more hard wooded plants are potted, if they are to be healthy, floriferous and long lived. By so doing the soil runs far less risk of becoming what is well understood by the term soured, and, of course, unhealthy. It may be asked, are the excrements of animals and decaying vegetation not beneficial to such plants? Undoubtedly they are; but not mixed in with the soil in a narrow, deep vessel like a flower-pot. Such highly stimulating, and more or less fermenting, substances are best applied as a top dressing when the plants require it. The turfey loam generally used for potting possesses, at first, much organic matter, of a less rapidly changing (because to some extent differently incorporated with the soil) as well as of a more natural character; and as a rule no other manure need be mixed with the ball of earth in the pots, unless it be of a less rapidly changing character, such as ground bones. Take for instance a Croton and a Dracæna—plants of very diverse characters. They thrive splendidly in light turfey loam, and require nothing else till their pots get pretty well filled with roots. Then a top dressing of rich manure is of immense

benefit to them, which if mixed with the soil at the time of potting, is not only unnecessary, but positively injurious. The roots which these two plants make in the loam pure and simple, with perhaps the addition of some charcoal and bones, are far more numerous, and of a different character to those produced in soil made rich and soft with rapidly decaying manure, in which the roots are long and less twiggy, escaping more rapidly down among the drainage into simpler and sweeter fare.

As a rule, we neglect far too much of nature's rule of potting and nourishing her children. We put manure of a too gross nature *into* the soil ; Nature lays it on the surface. We give a narrow deep body of soil, with comparatively little surface exposed to the air, and that little is far too often a mass of gangrene and slime ; on the other hand nature, as a rule, gives a shallow body of earth with a great wealth of surface clothed with living verdure of some sort. In all these respects we cannot, in small gardens or houses follow the lead of nature in the culture of plants in pots. But the further the departure from her ways, the more likely we are to be in error. We can, however, top dress more and mix less humus in our soils. Who will say that flower-pots would not be better if made a little shallower and a little wider ? With regard to the mixing of stones or charcoal, or clean broken potsherd, this can be followed without any offence to the eye, or any extra space. This I have come to regard as a cardinal point in the pot culture of nearly all plants that are not of the grossest and most ephemeral kind. Who that has much to do with plant growing and potting has not noticed that a plant that has clean crocks, or, best of all, charcoal mixed to a liberal extent, with the soil in which it has been potted, has always been in a more satisfactory condition the next time it required a shift, than when these substances find no place in the soil ? Take any hard-wooded flowering or ornamental foliage plant, and in potting it fill one side of the pot with soil in which charcoal is liberally mixed, and the other with soil devoid of that substance, and in twelve months, when the plant needs another shift, it will be found that there are double the number of rootlets on the side of the charcoal to what there is on the other. Wherever a few pieces of broken pot or charcoal are found in the ball of a plant, there the roots are found to muster in greatest numbers and health.

The mixing of these substances, in imitation of nature's prodigality, is not practised to the hundredth part in plant culture that its good effects demand. Charcoal has a wondrous charm for roots, and is of the very foremost importance in the soil of nearly all pot-grown plants. It has a beneficial mechanical effect ; has a sweetening tendency; is highly useful, absorbing ammonia and other plant food from air and water and from all decaying substances in its vicinity ; while its own character is most unchangeable. It

prevents stagnant water ; and being such a store-house, is a safeguard against extreme drought. In the case of nine plants out of every ten, it would be well if charcoal formed a fifth part of the whole compost in which they are potted.

The proper method of potting, and the description of soil to be used, will depend, of course, on the particular species of plants employed. Pots should be selected to suit the size of the plants, avoiding the too frequent habit of "over-potting," that is, of putting plants in pots that are considerably too large for them. It is much better to have to change them twice, or even three times in a year, than to put them at once into pots that are large enough to allow them to grow in for years. The plea generally put forward in favour of the use of large pots, is that they require less frequent attention as regards watering in hot weather than small ones, but that is overborne by the fact that a plant in a pot really too large, with a quantity of inert soil about its roots, is in far greater danger of sustaining injury from careless watering than a plant in a small pot full of active fibres ; for although the latter may flag or droop from lack of moisture, it soon recovers when water is supplied ; but an overpotted plant that gets into bad health from over-abundant root-moisture, is by no means so readily recovered. I would therefore strongly advise amateurs to rather under than over-pot their plants ; for, with the drainage in good condition, it is surprising what a small quantity of soil will sustain even a large plant if liquid stimulants be intelligently applied to it.

DRAINAGE OF POTTED PLANTS —The successful cultivation of plants in pots depends in a great measure upon the proper placing of the materials employed in potting. The first condition essential to success is perfect drainage ; if water-logged, no plant can continue long in a healthy state, whether it be in a pot or in the open ground.

The first thing to observe in potting is to place two pieces of broken potsherds over the hole of the bottom of the pot. Arrange them so that they may lie side by side. These pieces should have a slightly concave form, and the concave sides should be placed downwards ; this will enable the water to pass off freely. The next point is the best kind of material to use above these pieces, and this is broken pots. For very small plants these may be reduced to the size of peas, but they should be increased in proportion to the size of the pots. Four-inch and smaller pots would require the size mentioned, but from that to eight-inch pots may be drained with a coarser kind, say the size of Windsor beans, and for larger pots, two or three times these dimensions will answer. The depth of the drainage must also be guided by the size of the pots— $\frac{3}{4}$ inch will be enough for small pots, 1 inch for

medium size, and for larger sizes $1\frac{1}{2}$ inch, and even two inches will occasionally be required. It is an error, however, to drain too much, as it must obviously be at the expense of the material in which the plant has to feed. A proper and careful regulation of the drainage is therefore necessarily required in order that the object aimed at may be perfectly secured.

In collections in which little care has been bestowed upon the arrangement of the drainage, abundant evidence exists of the plants being in an unhealthy condition, an evil which arises not so much from an insufficient amount of drainage, as from a careless and injudicious application of it. Instead, therefore, of casting crocks into pots without thought or care, let them be regularly and evenly distributed. When this is done, the next point to consider is how to maintain the whole in an efficient state. It cannot be maintained in that condition if the soil is thrust into the pot without any regard to consequences. Under such circumstances, it must be evident that the water supplied from time to time would wash portions of soil down amongst the draining materials, and render them ineffective. To obviate this, a little coarse turfy material should be carefully placed over them. If this is done with caution, the drainage will be perfectly and economically secured.

FEEDING PLANTS IN POTS.

We next come to the most important point in the treatment of plants in pots, and the one on which success mainly depends. This is, the supplying them with nourishment of proper quality and in sufficient quantities. By this we do not mean merely copious drenchings with water, which, by most amateurs, seem to be considered the only *sine qua non* of success. We all know that even the richest soils contain but a very small percentage of the chemical properties essential to the support of plant-life, and most of these are soluble in water. The consequence is, that in pot culture, where only a small quantity of soil can be employed, these ingredients are either speedily absorbed by the plant, or washed out by the continuous stream of water that percolates through the soil from the supplies given for the support of the plant. When this occurs, the soil then becomes simply a reservoir to hold moisture. To keep the plants in proper health and vigour, it is therefore essential that we should supply them, at regular intervals, with such food as will replenish the exhausted properties of the soil. This may be done in two ways, first, by a top dressing of very old manure and fresh soil, mixed in equal quantities; and second, by regular supplies of liquid manure. The former can hardly be made too rich, but the latter should always be given weak, and for this reason, when stimulants are supplied in a liquid state, they are ready at once to be absorbed by the plant, and if given too

strong must always have a deleterious effect. "Weak and often," therefore, must be our maxim in supplying food in this manner.

Re-potting is advantageous and necessary to plants grown in pots; they may succeed very well for a time in the same pot with liberal feeding of and rich top-dressing; but re-potting must eventually be resorted to in order to supply the roots with fresh material. Young plants required to be grown into specimens, should not suffer by having their root space limited, otherwise their progress is not satisfactory; therefore potting in various stages is one of the principal items of a gardener's duty, and when a systematical routine is adopted, the plants thrive satisfactorily. When subject to careless potting by breaking the old ball unnecessarily or curling the roots into a heap to get them into the pots, or crushing them one upon another without a portion of soil intermixed with them, bad results can only be expected.

I would forcibly urge the importance of not using pointed sticks in liberating the roots either of hard-wooded or tender-rooted plants. This is held out by many to be most important and is largely practised. It is one of the greatest evils in potting that can be imagined, and more plants are ruined annually by it than from any other cause. Another great evil, and one that should be guarded against, is loose potting, especially those plants that require the soil to be firm, and this should always gradually slope to the collar to prevent the water passing through the new soil and leaving the old ball dry. After potting, the plants should be kept in a somewhat shaded position, until root action has again commenced. The sides of the pots should be syringed as they become dry, keeping them continually damp so as to save watering the plants for a few days after potting, to give the roots a fair chance of healing from the damage received. No matter how carefully the operation is performed, it is almost impossible to accomplish it without some injury to the roots. If properly potted, and the ball being sufficiently moist at the time and the soil in good order, the latter will be sufficiently settled without the customary evil of watering for some days at least.

It is important that the pots used should be clean, not only for the sake of the plants turning out better when required, but because plants grow much better in clean pots. The excuses made for the use of dirty pots by no means justify the use of them, either in large or small gardens. If washed, as they are emptied, very little labour is incurred; they do not then take half the time as if stored away and the soil and dirt allowed to dry upon them. Equally important is the washing of all crocks for delicate plants and as all plants love good drainage, and dislike the soil to become stagnant about their roots, it should be generally practised, yet this matter receives, but little attention in the

majority of gardens. When dirty crocks are used they hold the small particles of soil that may be washed down by constant watering and help to choke the drainage.

Experienced gardeners seldom disregard the importance of clean flower-pots for all kinds of plant culture. Amateurs rarely give this subject the attention it deserves, and are therefore troubled with many failures in consequence. Plants are soon affected with disease if grown in dirty pots; the soil soon becomes water-logged, sour and mossy, and the minute rootlets refuse to absorb moisture and nutrient from the walls in which they are imprisoned. Two things lead to deterioration in pots—one, and perhaps the chief, the excessive porosity and softness of the material of which they are made, and the other defective drainage. Pots made of good hard clay, with sides of moderate thickness, if a trifle dearer, are certainly much the cheapest in the end, as these neither get dirty so soon, nor are they so brittle, and therefore last much longer. Plants should never be allowed to remain too long in the same pots; frequent shifts both promote health and free root action, and the cleaner and sweeter the pots the more active the root action will be. Even apart from this, however, dirty pots are unsightly, and if it be not desirable at all times to shift a plant into a clean pot, much good may be done by clearing off the moss on the surface of the soil and redressing it with fresh material, and also by giving the outsides of the pots a good scrubbing in water. In clearing empty pots, two tubs should be used—one full of cold water in which the pots are placed to soak for an hour or two, and the other full of hot water in which the actual cleansing is done. If the pots be but moderately dirty, a whisp of straw or hay will make an effectual cleanser; but for very dirty, mossy pots, a brush is the most effective. A semi-scalding in hot strong soda water not only assists in the rapid removal of dirt, but destroys parasitical mosses and causes the pots to dry at once. No one having any regard to the requirements of plant life would ever use pots that have not been properly cleansed.

PLANTING OUT POT-BOUND PLANTS.—Whenever it is necessary to plant out anything that has become pot-bound, and it is not thought desirable to interfere with the ball, first make sure that the ball is thoroughly moist, and when planted, make the soil round it as firm as possible, leaving a slight cavity or basin when all is finished, to concentrate the moisture over the ball. When plants are planted from pots with hard balls in freshly turned-up soil, the water drains away too rapidly, and the plants perish from lack of moisture, even though plenty may have been poured round them. And this is one of the greatest objections which exists to planting out pot-bound plants of any kind without disentangling their roots. The work and difficulty of keeping plants put out under such circumstances, supplied with water in a dry soil, are

increased immensely, whereas if the roots be properly opened out in planting, and laid in fresh moist soil, one or two good waterings will be all that is necessary ; if dry weather follows, mulch thinly or thickly, according to the size of the plants and the nature of the soil. I am not now speaking of plants that are constantly grown in pots, and have occasionally, as they increase in size, to be shifted into larger pots. The two cases are not identical, for whilst there may be instances in which it may be desirable to reduce and open out the roots a little when subjected to fresh potting, in the majority of instances with plants in vigorous growth, the less the ball is broken up the better ; but then in growing plants in pots it is easy to make the thin stratum of new soil between the ball and the sides of the pot firm, so that instead of draining off the water from the roots, it in reality holds plenty of moisture in suspension, which gives the desired encouragement to the growth of the plant.

PLUNGING PLANTS IN POTS—The meaning of the term plunging—well known to gardeners—is that the pot is sunk in some substance that will retain moisture—soil, sand, coal ashes, sawdust, and cocoa fibre refuse being the substances commonly used, and of these the last-named is considered the best. The effect of plunging pots is that the soil they contain remains longer in an equable condition, and plants suffer less from the frequent excesses of moisture and drought, to which they are subject when the pots are exposed to the air. It may be easily understood that the daily watering of plants is an unnatural process, and therefore must be more or less injurious, retarding the progress of plants subjected to excess of moisture at one period, and perhaps in a few hours to immoderate drought in the soil, the process of assimilation being checked both when the soil is saturated, as it must be for some time after watering and also when too dry : both of these evils being reducible by plunging the pots, whether in the house or out of doors. Plants on window sills are especially liable to these fluctuations, and frequently also in plant houses, especially when the sun is allowed to shine on the pots ; while plants in pots set on the surface out of doors can hardly be got to thrive unless closely shaded, although watered twice or thrice a day, suffering not only from alternations of drought and moisture, but also of heat and cold, the rapid evaporation through the sides of the pot chilling the roots, which are again subjected to intense heat when the moisture has evaporated. Independent of the benefits resulting from the plunging of pots, the saving of labour is also worthy of consideration, being in nearly all circumstances very great ; and nurserymen, as well as other plant growers, should take advantage of it to lessen their very heavy labour accounts, to which watering in summer time conduces to largely increase.

LABELS OR TALLIES.

One of the chief attractions of a well kept garden is to have plants correctly and neatly named. The principal difficulty in carrying this out satisfactorily is to find a suitable material for labels. Zinc, galvanised iron, and terra cotta are all strongly recommended as being almost imperishable, but are unfortunately very expensive. Teak, and most of our other indigenous hard woods, are dark in colour, and must be well coated with paint before they are fit for use; the ordinary deal or pine label generally used in Europe not only attracts insects, but can scarcely be depended upon to last more than a season, and we have then not only the trouble of renewing them but frequently also the annoyance of many of them getting lost. The following method by which these may be made impervious both to climatic influence and insect ravages, will probably prove interesting to many of my readers. In a communication addressed to the French National Horticultural society, M. Huet, a well known authority, writes as follows :—

“Weary of having so often to undertake the manufacture of straw mats and flower sticks, I resolved, in 1878, to subject them to a preparation which had already succeeded well eight years previously in the case of ordinary wood, with the result that my straw mats, made four years ago, and in constant use from October to May, are scarcely to be distinguished from new. I am convinced that they will never be rendered useless through the material decaying. Peeled nut sticks prepared at the same time, and which have remained in the earth ever since, do not show the slightest signs of decay. I prepare them in the following manner: In a cemented tank containing a solution of sulphate of copper, I put the mats, preventing them from floating by means of a lever fixed on the edge of the tank provided with a weight at the other end, and which bears on two pieces of wood placed cross-wise on the mats. They are left for about twenty-four hours in the solution, when they are withdrawn; and when half dry they are steeped in lime water. I prepare in the same manner stakes, flower sticks, trellis-work, wood-work for frames, &c., but with this difference, that these remain in the solution from eight to fifteen days, according to the dryness and thickness of the wood. For the straw mats, fifty grammes of sulphate to a litre of water will be necessary, doubling the strength for the other materials mentioned. In order to quickly dissolve the sulphate of copper it should be put into a closed wicker basket, keeping it near the surface of the water. As an instance of the duration of wood thus prepared, some stakes fixed in the ground in 1870 are still in a good state of preservation. Similar stakes, but unprepared, last only two years.” M. Huet adds that string, straw for thatching,

certain kinds of wood for building, and many other things may be similarly prepared, but care must be taken that no nails are in the wood, or they will be promptly dissolved. Wood having received the double preparation of sulphate and lime takes paint very well. It would appear that the use of sulphate of copper is, to an extent, known amongst the Vine-growers of France, but M. Huet claims that the lime water bath is so great an improvement as to render the process of real value, and for this reason, that when the sulphate bath alone is used the effect of the dipping soon wears off ; whereas the lime, combining with sulphuric acid, disengages insoluble oxide of copper and sulphate of lime but slightly soluble.



CHAPTER IX.



Watering.



THE important question of watering, is one that is not only imperfectly understood, but frequently very much neglected in many gardens. In fact, if there be one operation more difficult than any other to instil into the native *malee*, it is this. With them, it is not at all an uncommon occurrence for plants to be watered carefully and regularly for a week, or possibly a month, and then perhaps neglected for a similar period. This alternate system of starving and feasting can never lead to satisfactory results. Plants that are growing in the open ground, can, to a certain extent, withstand such fickle treatment, for their roots being unconfined, are at liberty to ramble in search of moisture; but with plants in pots the case is entirely different. These are solely dependent on the grower for water, food, and all essentials to their existence; failing any of which, or on receiving an excess of any, they are in danger of losing both health and beauty, even if they continue to survive under bad treatment. What plants need, is constant and careful attention, and this is much easier accorded than is generally believed to be possible. It is not necessary to be always amongst plants with a watering-pot; but they should certainly all be looked over daily, and those that require it, watered thoroughly. Plants that are not allowed to become too wet or too dry, but are kept always at a desirable medium, will invariably thrive satisfactorily. The common habit of simply moistening the surface of pot plants is highly injurious, under such treatment the soil gradually becomes drier and drier at the bottom, until it will not absorb moisture at all, and the little that is given on the top will unavoidably run down the sides. When this happens, the only remedy is to put the pot and its contents, for about half an hour,

into a bucketful of water, this will restore the soil to its usual state, although the roots will take sometime to recover the check they had received. On the other hand, the effects of over-watering are even more prejudicial. The first result of this is, that the drainage of the pots becomes gradually clogged up, stagnation then ensues, all the fine fibrous roots, which are really the feeders of the plants, gradually, but surely, rot off, the foliage turns yellow and sickly, and death invariably follows. If taken at an early stage, all that is required to be done is to lay the pots on their sides for three or four days, till the soil has again become firm enough to handle ; they should then be re-potted in clean pots with clean drainage. In the event, however, of the roots having commenced to rot, they must be trimmed back carefully to the sound parts. If this has gone very far, and the foliage become, of a limp, leathery appearance, it is useless to attempt to bring them back to health again.

Some one of high standing in the gardening profession has said that a great number of the gardeners of the present day require the erroneous ideas "pumped out" of them before they can be really useful and clever members of the profession. I will not attempt to discuss this question here, but rather proceed to notice what appears to be, if not an erroneous idea, a practical mistake of the greatest importance to those engaged in plant growing. Probably there is not one who reads these remarks, but knows it to be a fundamental principle, both of Animal and Vegetable physiology, that the chief means of supplying food to the system of either is by the agency of water. Just as nothing which is insoluble in water can be taken up by the absorbent system of the animal, so with the vegetable. Everything in the shape of plant food must be first dissolved in water and taken into the cellular tissue in a fluid state, hence the importance of keeping the soil, in which the absorbent system or the roots of the plants are, continually in a moist condition. If this simple fact were acted on as a matter of practice by all gardeners there would be a marvellous diminution in the quantity of plants which, if not miserable, are miserable looking. Who does not remember the consumptive appearance especially of pot plants in those places where this starving-for-want-of-water system is carried out. Plants want their meals regularly, but too frequently they are regularly "put off" till they suffer for the want of them ; then, when the roots are desiccated, and the spongioles for the time being annihilated, water comes in profusion, only to make matters worse, for the large quantity required to thoroughly moisten the soil becomes hurtful on account of the roots being unable to perform the functions of absorption, and thus they are treated now with their roots in dust, and anon in puddle. It appears, in my estimation, one of the grossest errors horticultural writers fall into—the continually advising of

carefulness in watering, and being sure not to water plants till they are dry. This teaching is in direct opposition to that of nature. The rain does not wait till the earth is dried before saturating it ; nothing of the sort : any one can find out this for himself by examining the soil at regular intervals during the year, and excepting during extreme dry weather, no great depth need be gone to before finding moist soil. It used to be the most troublesome question I had to solve in former days, when on looking over my plants there were those which though not dry, yet were not wet, and the fear of doing something terrible in its consequences debarred the plants from receiving the water they required, till drooping leaves caused a double quick rush after the watering pot. I feel no fear now, when I come across a plant in this condition of moisture, to supply it with water. I don't like to see the soil get dry before watering ; and with heat, air, and light, the dread of killing it with too much water may be dispensed with, to the advantage both of plant and cultivator. Of course it is quite easy to give too much ; but judgment and a little experience will be the best guide to the time when water ought to be given. Generally speaking, when the particles of soil are in a state of non-cohesion, no harm will accrue from giving water even though the plant does not seem to require it, only water ought to be withheld till the same noncohesive property is noticed in the soil. Plants watered thus never suffer a check from want of water. We know perfectly well that plants extract moisture from the soil when to all appearance there is none in it ; but this is only a power for the preservation of life common to animals as well as plants. No one will say that it is impossible for animal life to be preserved for days without food, but as little will any one say that such a state is conducive to healthiness. It is just the same in the case of plants : allowing them to become dry, deprives them of the means whereby they procure sustenance ; and though not killed, if this style of watering is persisted in, the penalty will be, stunted plants and flowers, beside an unlimited host of insect pests to keep under and a larger quantity of water required to moisten the soil besides what escapes between the shrunken ball and the pot. The quantity of water required at one time for a plant is well worthy of attention. When the soil is constantly kept moist, it will be found that very little is needed to thoroughly wet it. Any more is prejudicial, inasmuch as every drop of water that drains through the bottom of the pot has dissolved its share of the goodness of the soil and carries it with it.

As to the *rationale* of supplying plants with manure-water, I always consider it full time to use it when a plant has well nigh used up the soil in the pot in which it is intended for flowering or permanent growth. In the case of flowering plants, such as the Camellia, a great many gardeners abstain from using it till

the buds are set, and then supply it to the plant one, two, or three times a week. Why it should not be used for watering every time the plants require it is not very clear to me. Giving weak liquid manure-water continually when the soil is exhausted, appears, to say the least of it, a more reasonable mode of using it than the plan of using it stronger and only occasionally. Some people make a point of faring almost sumptuously on Sundays, and going on "short commons" during the remainder of the week ; and giving manure-water in this manner bears some resemblance to it. We know that the plant will not use more in one day than is sufficient for its wants, leaving the remainder for future use ; still, little and often I believe to be best. My ideas on this part of the subject are, give manure-water as soon as a plant has filled its pots with roots ; give it every time water is required, taking care that it is very weak at first, though it ought to be of a stronger nature as the roots increase in quantity and the plant in size. Treated thus, there is a certainty of giving enough food ; but as the buds expand and the flowers develop, feeding ought to be dispensed with and water, pure and simple, used.

We hope it will be understood that these remarks do not apply to Orchidaceous or Cryptogamous Plants, nor to any species whose natural habitat is a dry one at root.

With regard to the watering of vegetable crops, the above remarks apply with equal force, to insure the most satisfactory results, they must never experience any check through the period of their growth, either from want of water or any other cause, it must be borne in mind that many vegetables which are naturally biennials in a cool climate, can with us, only be grown as annuals. It follows then, as a matter of course, that we should promote a rapid development by every means at our command ; the principal of these is undoubtedly a plentiful water supply when used intelligently, for the requirements of various crops differ immensely, for instance Cabbages, Cauliflowers, Kohl, and nearly all the Brassica tribe, can be treated almost as semi-aquatics—on the other hand, Peas and Beans require much less, for with these a superabundance of water leads to the production of an inordinate quantity of haulm and a corresponding diminution of the crop.



CHAPTER X.

Insect Pests.

PROBABLY there is no country in the world in which the gardener has more difficulties to contend with in the way of insects and other vermin than in India. We have not only almost every pest that our brethren in Europe have to contend with, but a host of others that are even far more dangerous ; and not only this, but we are further handicapped by the fact that those species which are most dreaded by English gardeners, such as Thrips, Mealy Bug, Red Spider, Aphis and Scale, which with them are only developed at a high artificial temperature, and consequently confine their depredations to plants grown under glass, where insects may always to a considerable extent be kept under control by fumigating, syringing, sponging, and the many other means employed for the purpose, in this country all these pests attack plants growing in the open air, where they are far more difficult to contend with, and which, if at all neglected, frequently get the upper hand and defy all efforts to exterminate them. Some writers maintain that insects are in every instance the effects of disease and not the cause, and although we cannot accept this as an invariable rule, still there is undoubtedly much truth in the assertion. One of the surest means of keeping plants clear of the ravages of insects is to maintain them in a vigorous state of health, for it is always found that it is the weak, sickly plants that are first affected when insects of any kind make their appearance. As an illustration of the fact that insects follow disease and do not precede it, I may mention the general idea that prevails in this country regarding the ravages of the white ant on vegetation. We continually hear complaints, especially from residents in Mofussil districts, that Roses and other plants have succumbed to the

attacks of this insect. But is this really the case ? We believe not ; in every instance that has come under our notice we have invariably found that the plants were weak and sickly, and that they were suffering from root fungus or some other disease long before the ants commenced their depredations. This opinion coincides not only with the observations of Firminger and other Indian authorities, but also of Figuier, Smeathman and many eminent naturalists who made the *Termites* their special study. It would be impossible for me to describe in detail the innumerable unwelcome visitors that are found in our gardens, but I must content myself with briefly describing the most important of them and the most effective means that can be employed for their extirpation.

APHIDES.

In this family there are supposed to be upwards of one hundred and fifty species; many of these, it is stated, confine their attention to one plant or family of plants, such as *Aphis laniera*, better known as the "American blight," which restricts its operations exclusively to the apple tree, and *Aphis fabae*, which is only found on the Broad Bean. Other species, however, are far more cosmopolitan in their ideas, and will attack almost anything that comes within their reach. The most common of these is *Aphis rosea*, better known as green-fly or plant lice. These not only attack Roses, but almost any other plant on which they can effect a lodgement, and if neglected for a few days increase enormously. The young shoots of Roses and other trees all round their circumference for the length of upwards of a foot are often covered with this species; they remain crowded against each other, sometimes there are two layers of them. If carefully observed, without moving the plants, they will, to all appearance, be tranquil and inactive, they are, however, gradually, but surely, absorbing the vital powers of the plants, piercing with the point of their trunk the epidermis of the leaves or stalks and drawing from them the sap they contain. Infinitely small as is the proboscis of the plant louse, when there are thousands of these creatures crowded on the stems or leaves of a plant it must evidently suffer. The enormous rate at which the *aphis* family increase under favourable circumstances seems almost incredible. Bonnet, a celebrated naturalist, gives the results of experiments made by him to prove how rapid is the multiplication of aphides ; he says :—" A single female produces generally 90 young ones ; at the second generation these 90 produce 8,100, these give a third generation which amounts to 729,090 insects ; these in their turn become 65,61,000 ; the fifth generation consisting of 590,490,000 will yield a progeny of 53,142,100,000 ; at the seventh we shall thus have 4,782,789,000,000 ; and the eighth will give 441,461,010,000,000. This immense number

increases immeasurably when there are eleven generations in the space of a year. Fortunately a great many carnivorous insects wage fierce war against the plant lice and and destroy immense numbers of them. Thus they are held in check, and kept from multiplying inordinately."

Smee in his comprehensive work, *My Garden*, in discussing this subject, says :—" We are in the habit of looking to astronomy for numbers beyond the capacity of man to realize, but the multiplication of *Aphides* afford a more astounding illustration. To represent the number of the progeny of one of these creatures for the space of one year, thirty-six figures placed in a row would be required. As the distance in miles between the earth and the sun is represented by only eight figures, and as seventeen figures, would represent the number of *Aphides* required to form a line between the same bodies, we may form a kind of indefinite vision of the immensity of the power of multiplication possessed by *Aphides* and have a dim idea of the rapid manner in which they can cover vegetation when they appear."

Innumerable recipes have been recommended for the destruction of green-fly, some of them, unfortunately, proving just as effective in destroying the plants as the insects with which they are infected, in the hands of an inexperienced operator. In the use of insecticides we must always take into consideration the constitution and nature of the plants to be operated upon : with hard-wooded plants having well ripened growth, we may use them much stronger than with those of a succulent nature, or where the wood is young and tender. With the former class of plants one application may thoroughly overcome our enemy, but with the latter it may be necessary to give three or four weak dressings at intervals of a weak or ten days. The following are some of the most reliable remedies than can be employed for eradicating this pest.

I. *Soft Soap and Tobacco*.—Dissolve one pound of soft soap in three gallons of water, and when cool add one quart of strong tobacco water. Small plants in pots should be immersed in the mixture, bottom upwards, and held in it for a minute or two, taking care that the soil is not also submerged. When taken out, allow them to stand about ten minutes, after which syringe with clear water till every insect has disappeared. Plants in the ground, or such as are too large to be dipped, should be thoroughly syringed with the mixture and afterwards with clean water.

II. *Sulphur mixture*.—Four ounces sulphur, four ounces powdered tobacco, four ounces quicklime, and eight ounces of soft soap in three gallons of water. This is only suited for hard-wooded

plants, which should be well syringed with the mixture and then allowed to remain for twenty-four hours, after which they must be thoroughly cleansed with water.

III. *Tobacco Powder*.—This is one of the most certain remedies that can be employed for the destruction of green-fly. Procure ordinary country grown tobacco, dry thoroughly and then pulverize as finely as possible ; procure a common powder puff or a cook's flower dredger, and after having first damped the plants, dust the powder freely over the stems and leaves. The plants should be thoroughly syringed about twenty-four hours after the application of the powder.

IV. *Tobacco Water*.—Take a pound of the strongest tobacco leaves, boil them for half an hour in a gallon of water, then strain and add half a pound of Gum Arabic and boil again till this is thoroughly dissolved ; when cool, add six gallons of clear water. This should be used in the same way as No. 1, but the plants must remain for about six hours before being syringed. The object in adding gum is to insure its adhering to the insects.

Nos. III. and IV. are recommended to the uninitiated in preference to the other ; they are not only cheaper, but are rarely injurious to plants even when used in excess.

AMERICAN BLIGHT.

The American Blight (*Aphis Langera* or *Eriosoma Mali*) is, we believe, entirely unknown in this country.

ANTS.

We next come to one of the most troublesome of all the insect families, and one of which this country has a vast number of species. Ants, black, red, brown, ashy or yellow. Ants, omnivorous and graminivorous, abounding in every district that is not actually a swamp. Fortunately for the gardener this is not one of those pests that seem to have been sent into the world exclusively for his edification, or rather we should say mortification. Ants distribute their favors equally amongst all classes of society, finding a congenial home either in a mud hovel or a mansion, although it must be admitted that the richer the food available the greater the attraction for them. The following methods of destroying ants are given in Quin's Garden Receipts —

Bones.—An effectual way of destroying ants in places where boiling water cannot be used is to lay half-picked bones about. These will soon be covered with ants, and can then be thrown into a vessel of boiling water, after which they should be again laid

down to attract a fresh batch of victims. By persisting in the use of this trap a house will be completely cleared of ants in a short time; the sooner, of course, in proportion to the number of bones employed.

Camphor.—If the ants have formed their nest at the root of a plant, pour upon them a quart or so of warm water, in which a piece of camphor, the size of a Hazel nut, has been steeped. This thoroughly destroys them, and is not the least injurious to the plant.

Chalk.—To prevent ants from climbing trees, scrape the bark in a ring about 2 in. wide around the tree; then take a piece of chalk and rub it on the ring all round till no green bark can be seen. The moment the ants' feet touch the chalk it offers no solid footing, and they fall back, not one being able to ascend. A chalk mark, at least half an inch in breadth, around the upper edge of sugar barrels, boxes, &c., will not admit one ant into the interior. The same mark drawn on the edges of shelves will also prevent the approach of an ant. The chalk mark must, of course, be perfectly continuous.

Flower-pot Trap.—Suppose a colony of ants to be commencing operations on a lawn, it is an easy matter to trap them all by placing a large empty flower-pot, with the hole stopped, over it. The ants will build up into the pot, and in a short time it may be lifted with a shovel and carried away and dropped into a vessel of water, which will make an end of them.

Flowers of Sulphur.—Flowers of sulphur are very useful in checking ants where boiling water cannot be used.

Gas Tar.—When ants make a run up the stem of a fruit tree, a line of gas tar all round will put a stop to their progress, and do no harm to the tree.

Guano.—It is not generally known that fresh Peruvian guano will drive ants from any spot, however firm a hold they may have obtained on it.

Mortar.—Make a mortar bed of their nest, stirring the ants in with the mud until their nest becomes a mass of mortar, which may then be removed.

Petroleum.—Pouring a little petroleum upon their nest every few days will effectually kill or banish ants. Paraffin oil, benzoline, and kerosene are also very effective.

Quassia.—The following mixture has been found successful:—Four ounces of quassia chips, boiled for ten minutes in a gallon of water, dissolving in the liquid while cooling 4 oz. of soft soap.

Quicklime.—Perhaps as good a way as any of exterminating a nest of ants is to dig the nest open and flood it with a kettle of boiling water. If a bushel of quicklime be then thrown in and the earth replaced, the colony will be broken up, and the few ants left will seek other quarters.

Raw Meat.—A very effectual plan of getting rid of ants is to place raw meat in dishes or vessels of any kind about places which they infest, and as they prefer that kind of food to any other, they surround it in thousands. Boiling water is then poured upon them, and this, if persistently applied, with the bait above recommended, will in time effect a good riddance.

Water.—If the ants' nest should be in a pot amongst the roots of a plant, the best way is to immerse the pot and plant in cold water, and let it stand for five or six hours, by which time the ants will all be drowned and their eggs destroyed. One of the most simple and effectual ways to destroy ants is to pour boiling water on the nests at night, but in those case where boiling water cannot be applied, recourse must be had to some other remedy.

It must be borne in mind that in applying any of the above remedies, it may be necessary to repeat the dose several times. The ant is extremely tenacious of life, and is one of the "die-hards" of the insect world. Not only this, but during the breeding season, as instinct leads it to carry off its eggs to a place of safety the moment that danger threatens, the immediate neighbourhood of the nest must therefore be looked after, as well as the nest itself. When the ants are caught alive they must be at one carried away to a distant spot, and either burnt or drowned.

THE CABBAGE GRUB.

This is one of the most troublesome pests in our Indian Gardens, especially where the soil is of a light sandy nature. The Cabbage Grub is the larva of a small insect belonging to the beetle family (*Curculio contractus*), and attacks indiscriminately almost every member of the Cabbage tribe, generally causing the plants to form "club roots." When the grubs first begin their ravages there is nothing to indicate their presence until the plants commence to turn an unhealthy colour, flagging in the sun and eventually withering away. The following remedies are recommended in Quin's "Garden Receipts" —

Lime and Soot.—One of the best methods of preventing the inroads of Cabbage Grubs is to make each plant unpalatable to them. In the spring procure some newly-burnt lime, and lay it under cover until it becomes air-slaked. Then take an equal quantity of soot and mix it with the lime. In planting, the holes

are made with the trowel in the usual way ; each plant is dropped into its hole, an inch or so of the soil put over the roots, a good watering given first, then a moderate handful of the soot and lime mixture thrown in each hole, and the remaining soil filled in.

Soot and Garden Soil have also been recommended as a specific. Take equal parts of soot and fine garden soil, thoroughly mix them with water to the consistency of thin mortar, and dip the plants in the mixture up to the base of the leaves before planting. This is said to be a safe and never-failing preventive of clubbing.

Wood Ashes mixed with water and put into the holes after watering is also a favourite remedy in wood-burning districts. Some ashes should also be incorporated with the soil of the seed-bed, as well as strewed over the ground generally.

Another remedy is to dip the roots of the plants, before putting them into the ground, into a mixture of soot and water, with the addition of a little saltpetre. This should be made of the consistency of thick paint, using 1 lb. of saltpetre to each gallon of soot. Charcoal dust, spread $\frac{1}{2}$ in. thick on the plot, and then just mixed with it by the point of the spade, will sometimes act as a preventive, and is always of some benefit. A dressing of lime from the gasworks, at the rate of twelve bushels to the acre, has also been found effectual.

In applying the above remedies, great care must be taken not to put in the mixture first and water the plant afterwards, as this would have the effect of washing the soil stems clean and taking the mixture down into the soil away from where it is required, thus affording no protection to the plants.

THE CABBAGE APHIS (*Aphis Brassicae*)

These in appearance differ but very little from the Rose Aphid and the same remedies there mentioned may be employed.

CATERPILLARS.

In England, and many other parts of Europe, caterpillars form one of the most dreaded pests in vegetable gardens. Fortunately in this country, especially in the plains, we are rarely troubled with them. The cabbage family, which in Europe is so liable to their depredations, is here, except in very rare instances, never affected. A few of our flowering plants, and more especially those belonging to the Amaryllidaceæ, such as *Crinums* and *Zephyranthes*, are however sometimes entirely devoured by them. In the Himalayas, at an altitude of 5,000 to 8,000 feet above sea level, the true white cabbage butterfly (*Pontia Brassicae*) makes its

appearance and proves quite as destructive as in Europe. Miss Ormerod in "The Manual of Injurious Insects," gives the following remedies :—" Head-picking the caterpillars is a tedious remedy, but where there is no great extent of ground it is advisable as a certain cure. The application of finely powdered lime in a caustic state, or of fresh soot, will get rid of the caterpillars, but may be objectionable with regard to after use of the vegetable. A sprinkling of fine salt has been found very serviceable, carefully applied, so as to fall on the caterpillars ; and they may also be killed by applications of weak brine, lime water or soap-suds."

Flour of sulphur dredged over the plants, or a weak solution of alum lightly syringed over the leaves, have not, so far as I am aware, been experimented with, looking at the success of these remedies in other cases, they are well worth a trial. Many kinds of dressings, such as wood ashes, &c., have sometimes succeeded and sometimes failed so entirely that it is probable some point in the method, or the time of application, needs attention. It often happens that a dusting given when the dew is on, or after light watering (so as to make it adhere to the caterpillar and also to the plant) is of great service, whilst the same application given in the middle of the day is perfectly useless.

It has been noted that caterpillars which appeared healthy up to a given date, immediately after (following on sudden rain) perished, and were found to have become mere lax skins containing a cream coloured fluid. Many kinds of caterpillars are attacked by purging when feeding on wet leaves, and looking at these points, and also that dry weather is the time when these special pests most abound, it appears likely that a good drenching from anything, such as a hose or garden engine down to a watering pot, if nothing better was at hand, might do good ; firstly, it would probably make many of the caterpillars fall off, and if treated as above mentioned, that is killed, or means taken to prevent their return, many might be got rid of ; and secondly, though artificial means would not help us so much as the change of weather, still the sudden chill from the cold water, and the wet state of the food which would be induced if the operation was performed in the evening, would probably clear off many.

Good cultivation and heavy manuring of the ground, thereby running the plants on quickly, has been found serviceable, and the application of liquid manure will save a crop even when badly affected.

If by manure and good cultivation the crop can be kept in a state of growth, that will make a larger amount of leafage per day to each plant than the caterpillars on that plant consume, all will be well ; but if, through drought, poor ground, or any other cause,

the caterpillars take off more than the plant makes good, necessarily it dwindles or perishes. This point is a most important one to be considered in attacks of this nature, and especially with regard to large crops to which it is most difficult to employ any kind of insect preventive in the shape of dressing, remuneratively."

SNAILS AND SNUGS.

*Of all the enemies the gardener has to encounter, there are scarcely any more difficult to overcome than slugs. The insidious nature of their attacks almost forbid any attempts at capture, for they do not commence their ravages till after nightfall, and it is a strange fact, that the neater a garden is kept, and the fiercer the war we wage against weeds of all kinds, the more vigorously will this enemy attack us, so much so, in fact, that frequently in the case of small seedling plants, after we have carefully removed every weed from their beds, these troublesome pests will step in and complete the operation of cleaning the soil by removing every sign of vegetation from it. When we can find our foes, the best and surest remedy is *Lynch law*; but the finding of them is the difficulty. Although we may be "up with the lark in the morning we shall be too late for them, as they will already have gone back to their retreats, for the slug is probably endued with sufficient common sense to understand that if the early bird cannot catch the worm, he will look elsewhere for diet, and what is more luscious to his taste than the slimy slug? The most effectual means of destroying them is a free use of lime water. This is prepared in the following manner. First, take fresh, unslaked lime in any desired quantity and add water to it at the rate of two gallons to each pound of lime, and let it stand still, till effervescence has ceased and the water becomes clear and limpid again, the lime having sunk to the bottom. Give a liberal dressing of this solution over the whole surface of the beds infected, and the results will be as amazing as they are gratifying. For it will not only promote a more vigorous growth of the plants, but will completely demolish the slugs, as by day they bury themselves in the beds that they devastate by night, and the lime water follows them into their holes and destroys them completely. Let any of our readers who are troubled with slugs, try this plan when young seedlings are just appearing above the surface, and see the benefits derived from it. For ordinary garden purposes an occasional drenching of the whole surface with lime water, will not only prove a powerful stimulant to vegetation, but will also keep slugs and many of our other enemies in check.*

If, however, we are determined to effect their capture, baiting them with bran is probably the surest method of doing so. The

easiest way to proceed is to take some pieces of slate, or flat stones, or pieces of tin, and lay them about in the garden among the plants, distributing them very liberally. Just at sundown, go out and place a teaspoonful of bran on each piece of slate or tin, and the slugs will soon become aware of it and begin to gather and feed on it. In about two hours, when it is dark, go out again with a lantern, and a pail containing salt-and-water ; pick up each piece on which the slugs are found feeding and throw them into the brine. *This will soon make an end of them.* Although I believe it is almost impossible to entirely extirpate these pests from any garden where they have once become firmly established, (and what garden is entirely free from them,) still from my experience, I am convinced that the remedies described above, if persevered in, are the surest means we can employ to reduce their ravages to a minimum.

SCALE INSECTS.

There is certainly no family of insects whose ravages are more to be dreaded than those belonging to this group, not so much from the virulence of their attacks as from the fact that in consequence of their closely resembling in colour the bark of most of the plants and trees they infest and their peculiar formation, they are liable either to be overlooked altogether, or frequently, at certain stages in their development, lead the uninitiated to imagine that they are simply excrescences of the tree caused by the exudation of the sap or some other natural cause, and are consequently neglected until they have done material injury ; whereas, on the other hand, if they had been taken notice of at an earlier period, their extirpation would have been comparatively easy and without danger to the plants.

Insecticides.—Prevention is better than cure, and whenever fresh plants are to be introduced into a house they should be examined to see that they are clean, and if any traces of the insects are found, the plants should be thoroughly cleansed with one of the following insecticides —

Hard-wooded plants with smooth leaves may be washed or dipped in a mixture of paraffin oil and water, one wine-glass of oil and three gallons of water kept well mixed ; if the oil is first mixed with double its quantity of soft soap, it will not separate so quickly from the water ; the next day the plants should be thoroughly cleansed by a good syringing with soft water. Soft-wooded plants, or those with hairy leaves, are liable to injury from the oil, as it is difficult to cleanse them properly afterwards, and if much of the oil remains on them, their pores get clogged up with it. Plants that will not bear this treatment may be washed

with a stiffish brush and soft soap and water, or gently brushed with camphorated spirits of wine diluted with 50 per cent. of water, or one of the insecticides sold for the purpose.

RED SPIDER.

If the size of this insect were proportionate to the damage it does to plant-life, it would be much more formidable in appearance than it is, but, being exceedingly small, it frequently escapes detection until the plants upon which it makes its appearance have sustained serious injury. Great numbers of cultivated plants, especially those grown under glass, suffer from its ravages ; but such as have thin, soft leaves, like Vines, Cucumbers, and Melons, are more subject to it than others. The living insects cannot exist in a low temperature, but their eggs are proof against the lowest temperature. The Red Spider has a great aversion to moisture in the atmosphere, and still more to its application directly overhead by the use of the syringe or garden engine, a fact which at once indicates the means most likely to prevent its appearance where water can be used plentifully without injury, in other respects, to the health of the plants.

WHITE ANTS.

A chapter on Insects would hardly be complete without some reference to this most terrible of all pests of our Indian Gardens, and yet nothing new on the subject can be said, for although there may be many ways of mitigating their ravages, a certain and effective destructive agent yet remains to be discovered, that is one that can be used with safety amongst growing plants. Kerosine oil is no doubt a valuable agent but it must be used with care, one of the chief objections to its use is the difficulty generally experienced in mixing it with water, this may be readily overcome by first adding an equal quantity of sour butter milk (*dhai*) to the oil, shake these well together in a closed vessel for a few minutes then add water at the rate of 3 gallons to each pint of oil and apply immediately to the soil where required, another good agent is pure water when liberally applied, level down the hills about three or four inches below the surface and flood copiously for three or four days, this will have the effect of dispersing the colony but will kill but a very small percentage of them. In places where White ants are very troublesome, great care should be taken that all manure, leaf mould, or anything else added to the soil, should be thoroughly decomposed.



Part ii.

The Vegetable or Kitchen Garden.

THE vegetable or kitchen garden in India, and especially near any large town, is, a sadly neglected department. Very few private individuals, even if they have the requisite amount of space at their command, care to take the trouble to grow their own vegetables. Why this is so, it is certainly difficult to explain, for, with the majority, but little attention is required to grow them well. Many doubtless, are under the idea that during the season our markets are so well supplied with every kind of vegetable, and at such moderate prices, that it is not only cheaper but far less trouble to procure daily whatever may be required. Undoubtedly this is, to a certain extent, true; but is this the only thing to be thought of? What can be said with reference to the quality of vegetables procured from our markets? Admitted that most of them are grown to a very high state of perfection as far as size is concerned, but that is all that can be said in their favor; the quality is invariably of the poorest description. The reason for this is very plain to any one at all conversant with the subject. Not only are the varieties grown of the oldest and most inferior description, but, as a rule, they are produced from acclimatised seed, which, in many instances, has been growing in the same locality for years. Even in Europe, it is an admitted fact that nearly every kind of vegetable deteriorates by being grown successively on the same soil. How much more is this likely to be the case in this country, where they have also many other difficulties to contend against? As a rule, native gardeners are under

the impression that size is the one object to be attained, and there is a certain amount of rivalry amongst them to produce enormous specimens of Cabbages, Cauliflowers, Celery, etc., but further than this, their ambition does not go. They are content to grow the same varieties as their fathers, and possibly their grandfathers, grew before them. Take the following for instance:—The only variety of Cabbage grown for the Calcutta markets is the Drum-head or Cattle Cabbage; the only Turnip, the "Flat Dutch;" the only Lettuce, Green Hammersmith; the only Pea, a variety known as the "Patna Pea," which is the common white English field Pea, and the same with nearly every vegetable, only one or two of the oldest varieties are to be found. But why should our market growers care to make a change? They certainly can see no reason for doing so, for they find that, not only are they able to dispose of what they now grow readily, but also that to secure good prices for their produce size is the only desideratum, and yet how often we hear it remarked that "vegetables in this country have not the flavour they possess at home." I believe this to be an entirely mistaken idea, and such a conclusion can only be come to by the consumers of bazaar produce. If these grumblers could or would grow their own supplies, and grow them as they ought to be grown, and not leave them entirely to the tender mercies of the *malee*, they would soon give a different verdict,—for, provided good seed of good varieties is procured and properly cultivated, not only will our vegetables be in no way inferior to those produced in Europe, but in many instances will be infinitely superior, for during the cold season here we have a climate probably equal to any in the world for the successful cultivation of nearly every description of European vegetable.

It would be a difficult thing to say why the culture of the Kitchen Garden should be the last of which amateurs as a rule get a thorough knowledge, seeing that it is the most generally useful of all, for a Kitchen Garden is indispensable wherever a gardener is kept, whereas other branches, embracing luxuries such as orchid culture and ornamental flower gardening in all its many and various forms, is indulged in according to the taste and means of the owner, and vary in its requirements in almost every establishment. In many gardens the ornamental or show portions of the grounds have so overgrown the amount of labour at disposal, that the useful, but less conspicuous portions are robbed of the necessary attention. If the Kitchen Garden crops require screens to hide them, the fault must lie at the door of the cultivator and not in the crops themselves, for we are not acquainted with anything that yields more lasting pleasure to a gardener than a well-ordered Kitchen Garden. There are at all seasons some objects of interest in crops at various stages of growth, so that it would be difficult to say which is the most interesting season, for he who is to achieve

satisfactory results must look far ahead and provide against the influence of adverse seasons, the effect of which will well-nigh baffle the most experienced cultivators, even when well acquainted with the best varieties, seasons of sowing, and the most favorable soil and positions for the site of the Kitchen Garden. In pointing out a few simple rules that tend to make the Kitchen Garden of equal interest with other departments, I would remark that it is on the small matters connected therewith that success or failure rests. In laying out a Kitchen Garden we must set our minds entirely on the object we desire to be attained, *viz.*, that its usefulness will be measured by results, and whatever our notions on straight lines in pleasure grounds may be, there can be no question of their thorough adaptation for the end in view; therefore all boundary or intersecting walks or roads should be perfectly straight and parallel with each other. Good walks are indispensable, not only for comfort in walking, but should be capable of bearing the carting and wheeling necessary to every portion of the garden; they must also be well-drained and present a firm, moderately rounded surface, and kept at all times scrupulously neat and clean from weeds and litter of every kind. The question as to the number and width of the garden walks must in the main be decided by each individual occupier, who will no doubt be guided by the extent of his garden, which, if it be small, may simply be intersected by a path down the middle, or, if large, a path round the sides in addition, but no more walks than are absolutely necessary should be made.

SOILS.

Every day experience points to the fact that in the matter of soils successful cultivation depends not alone on the land containing the requisite food elements to supply the wants of the plants grown thereon, but also to the texture of the soil being such as to favour the production of roots, and to admit of their penetrating freely through it in search of the elements therein present. It is generally found that the progress made by a plant is regulated by the greater or less quantity of roots it possesses, particularly the small feeding fibres with their absorbing extremities which, where the conditions of the soil are favourable, will usually be found ramifying in all directions, acting the part of foragers to supply the army of shoots and leaves above ground with the water requisite to keep up a healthy existence. Nature does not work in vain, and few, if any, of her children make greater efforts to adapt themselves to circumstances than do plants; and where the texture of the soil happens to be too close to admit of the feeding rootlets entering in their wonted fashion, their ramification is correspondingly reduced, the result of which is that the progress made by

the plants to which they belong is so much slower. In the case of some plants, such for instance as are of an enduring nature, requiring a long period to reach maturity, the slower growth may be no disadvantage, possibly the reverse; but with most things, particularly those that are of an annual duration, like the majority of kitchen garden crops, slow impeded growth, such as instanced, is much loss—loss from a twofold point of view, in quality as well as in quantity, for it goes without saying that vegetables in any way checked or retarded in growth, are never equal to such as have been grown under conditions favourable to their quick and free development. Cultivation by which the land is periodically stirred to a depth commensurate with that to which the roots of the plants to be grown naturally descend, aided by the drying influences of sun and air, and the disintegrating action of frost, effect a good deal in the way of pulverising and breaking up close adhesive soils, still, where there is naturally an absence, or all but absence, of sand in the soil, the effects of digging and trenching, helped by the weather influences, do not effect the permanent loosening of the soil in a way that benefits it for the full production and extenion of roots, as even in the short space of a few months the naturally adhesive nature of the land is such that in garden phraseology it goes together again to an extent that seriously impedes root-progress. Additions in the shape of manure or vegetable matter dug in have an influence for a time in keeping heavy soils of a clay-like nature more open, but as this kind of matter decays it leaves little impression of a lasting character on the close compact mass with which it has been incorporated. Nothing short of the addition of some matter that will mix with the soil, but that will not decompose, will suffice, otherwise no more than a temporary influence will be effected. Sand, the material that where naturally present in the soil keeps it permanently in a condition suited to the free action of roots, is the commodity that would present itself as the most suitable for adding to heavy retentive soils, such as many kitchen gardens are composed of, and to these my remarks mostly apply; but unfortunately in localities where the land is of the most stubborn clayey nature, there often happens to be a total absence of this material within a distance that admits of its being used in quantities sufficient to fully remedy the evil, and, beyond this, it is generally found that where sand is applied with this object to land that is annually dug, it gradually gets washed low down so as to get below the point where most wanted. But there is another and a lasting remedy whereby land of the description under notice can be brought to a right condition, and which moreover in most cases offers the advantage of the material being on the spot in the shape of clay, which simply needs burning to bring it to a state that will correct the evil in a way that nothing else will, as from the time

it is dug into the land no perceptible disintegration takes place, and through the fact of its being lighter than the soil with which it is incorporated, it does not descend. In gardens where the land is of a heavy clayey nature, the soil is usually insufficient in depth, and here another advantage presents itself by bringing up 8 or 10 inches of that which lies next below that which the spade has hitherto stirred, burning and then working it in with that which has previously been at the top. The staple is so much deepened, and the whole brought to a condition that befits it for the free unchecked extension of the roots of the different crops to be grown on it, with the further gain that the temperature of the soil is increased by the quicker passage of superfluous water from it consequent on its more open condition. Clay, or, as it is more generally termed ballast burning, is often looked upon as a formidable operation by those who reside in localities where little or none of such work is carried out, yet it is neither difficult nor expensive, even in places where fuel may be dear. Work such as here described may be done at little, if any more cost per acre, than the market gardeners often spend on a single application of manure, with this difference, that where the land is too adhesive in nature for the roots of plants to act in it as they should, one may go on indefinitely applying manure to it, which under the conditions, will never be more than half effective from any point of view, whereas the ballast remedy will be complete and lasting in its influence.

It is no exaggeration to say that the cost of the work will, in future years, be quite covered by the saving in labour effected through the much greater ease with which digging, hoeing, and other operations will be carried out through the freer condition of the soil, with the additional advantage that it will admit of being worked in weather that would preclude the possibility of its being stirred if in its original state.

TRENCHING.

Deep stirring of the soil is one of the most important points in vegetable culture. There is no soil that cannot be improved by it, but its effect will be most noticeable on heavy lands. In all soils, there is a vast mine of fertility locked up that only requires to be judiciously worked to have a marked effect upon the crops. During any break in the rainy season, all available labour that can be spared should be devoted to this purpose. Cleanliness and surface culture of the soil are, to a certain degree, effective in the development of plants, but without deep stirring the land will not produce to the full extent of its capability. A dry season severely tries the crops of the shallow cultivator, and infallibly proves the advantages of deeper culture; manures in such cases, near the

surface, do not produce their proper effect, and the plants in many instances, if they do not actually perish, are stunted and dwarfed for want of a deeper and firmer grasp of the soil. Moisture is one of the greatest essentials in the cultivation of succulent vegetables, and the importance of deeper culture as the means of attracting and retaining moisture in the land should be more generally recognised. In trenching land where the sub-soil is very inferior, probably in extreme cases some injury may result from bringing up too much of the crude inert soil from below to the surface. All clays are retentive of moisture in wet seasons, but they often crack and part with it too readily in dry hot weather. Now all this may, in a great measure, be altered or counteracted by deep culture. The drainage in wet seasons would be more effectual, and in dry weather the advantages of deep culture would be two-fold ; there would be great facilities for the plants striking their roots downwards, and the loose sub-soil would encourage the ascent of moisture from the water bed below on the principle of capillary attraction. In dealing with a bad sub-soil it will be better to try and improve it without bringing any to the surface. This can most effectually be done by removing the top spit as in bastard trenching, and then digging or forking into the bottom any fertilising material such as manure, ashes or burnt earth.—anything in fact that will tend to open up and disintegrate the crude mass. In this way a steady improvement will go on, air and water will percolate through it more readily, rendering its mineral constituents more soluble and suitable food, and in the course of time portions of it may be brought to the surface and still further improved by exposure to the atmosphere.

SEEDS.

Seeds should be procured from reliable sources, as nothing is dearer in the end or more vexatious than bad seeds. If you cannot rely on all the seed germinating, it is impossible to have satisfactory results, and patches and gaps are a great eyesore. I would always say—select for yourself, for all collections of seeds contain some that you do want and many that you do not. No one can select for you without knowing the requirements of each individual place. Always have enough and to spare, as the season for sowing some crops is soon lost, and unless you make provision for failure by duplicate sowings, great inconvenience or the loss of a crop may result. It is a mistaken economy to buy cheap seed ; breed or purity of strain.—induced by constant selection—has a value in seeds even beyond their germinating powers. Seed may grow well, and produce strong plants, and yet the crop be inferior for want of the necessary care in the selection of the stock. This is often lost sight of by the purchaser of cheap seeds.

The rage for cheapness and the strenuous efforts made to meet it in many quarters are totally incompatible with the growth of seeds of the highest quality. The whole of the processes involved in the production of good seeds are expensive. The skill to select the best strains, and constant attention needful to keep them true, costs much time and money. Good soil is also needful to give good seeds, and the whole circle of its sowing, cultivation, harvesting, cleaning, sampling, storage, packing, and sale, is an expensive one. From the time it reaches the earth as a seed crop, till it returns to it again as a produce crop, it costs money.

Many people complain of the dearness of seeds. Those conversant with the capital, skill and labour devoted to its growth, often marvel at the cheapness of good seeds; but whatever the actual price of the latter may be, they are cheapness itself contrasted with what are called cheap seeds.

Some cultivators seem to imagine that if they have only a great weight or bulk of seeds for their money all will be well. There cannot be a greater mistake. The value of seed is the exact number of healthy plants it can produce. The percentage of growing seeds in samples varies as widely as from 10 to 95 per cent. Supposing seeds that yielded only 10 per cent. of living plants sold at a quarter of the price of seeds that yielded 95 per cent., the good seeds would still be more than nine times cheaper than the inferior. Nor does this express all the difference in favour of the good seed, for the inferior probably only yielded a half or quarter of a crop, though the rent of land, rates, cost of tillage, culture, and probably harvesting, were just as high for the poor crop as for the best. In fact, some of these items, such as hoeing, weeding, &c., are often highest on the worst crops, for when the crops fail, the weeds multiply and thrive the more.

These are a few of the considerations that should induce every one to sow in their gardens and on their farms the best seeds only; but how to get them—that is the question. The answer is less difficult than many imagine. Deal only with the best and most respectable seedsmen, and be willing to pay a good price, for the dearest seeds are invariably the cheapest in the end. Even the best may not always grow, for in some seasons it is impossible to furnish perfect seeds, and millions are killed by being sown in beds no better suited for them than a pillow or mattress of Furze would be to their cultivators.

SOWING.

This is an operation that should never be entrusted to a native gardener, unless done in your presence. Honesty is a virtue hardly known or practised amongst them, and a very common trick is to substitute worthless bazaar seeds for those that have been entrusted

to them to sow. For very early crops, which must be sown before the expiration of the rainy season, it is necessary to make beds raised three or four inches above the surrounding soil. These may be of any length required, but should not be more than three feet, or at the most four feet wide. They should have a narrow drain running between them to carry off any excess of moisture. For later sowings, when the rains are over, the old native method of laying out the ground is certainly the best. This is done by dividing it off into beds three or four feet wide, with a raised path running between them about one foot wide, and three or four inches high, which must be well beaten down. This serves a two-fold purpose—giving free access to the vegetables for weeding and watering, and also retains a much larger amount of moisture at the roots of the crops than when the sowings are made on raised beds. Care must be taken that the soil in the beds has been either trenched or dug to the depth of at least eighteen inches, or, for root crops, even two feet will not be too much. After being well pulverized, a liberal supply of well-rotted manure should be added; the quantity will, of course, depend on the kind of vegetable to be grown in the bed, for their requirements differ to an enormous extent. Take, for instance, the Cabbage or Cauliflower, for which the soil can hardly be made too rich, but supposing Peas were grown in the same soil, the probability is they would delight their happy possessor by the vigour of their growth at least for a time, till he found that all their strength had been expended in the production of haulm, for in such cases, although they may possibly bloom freely, the pods rarely set at all. But not only is it necessary to regulate the quantity of manure according to the crop to be grown, but it is also equally essential that the description of manure best adapted to the requirements of each particular plant should be employed. It is, of course, a well known fact that the properties of various animal manures differ very considerably in their component parts, some being rich in ammonia, others in lime, potash, &c. In like manner also each particular vegetable possesses one or more properties, generally to a much greater extent than the soil naturally is able to sustain. If, therefore, we employ a manure possessing those ingredients necessary to the life and well being of the plant, it naturally follows it must be benefited thereby; but, on the other hand, if a manure is used whose principal part is one found but in a minute degree in the class of plants to which it is applied, and which in most cases would exist naturally in the soil to a greater extent than is actually required, it follows that the crop is in no way improved, and in many cases would be seriously injured thereby, besides the manure being entirely wasted.

After manure has been added, and the soil broken up as finely as possible, the surface should be turned over daily for at

least three or four days before the seed is sown. This exposes it to the beneficial action of the air—a point that is of more consequence than many are disposed to believe. It is a too common practice in this country to allow that portion of a garden allotted to the cultivation of vegetables to remain a desolate waste through the whole of the hot and rainy season, during which time not only will an immense quantity of weeds accumulate, but it also thereby harbours an unknown quantity of insects of every description, much to the detriment of any crops that eventually may be grown in the soil. Instead of this, if the ground is regularly turned over once or twice a month, not only will it prevent an accumulation of weeds and insects, but the soil will receive more benefit in thus having every particle of it exposed to the air, than it would from a heavy dressing of the best manure that could possibly be procured. The next point to be considered is the condition of the soil at the time of sowing. If it is too dry, the seed will fail to germinate for want of moisture, and watering immediately after seed has been sown is also very prejudicial to success, as this causes the soil to become caked and hardened, thereby preventing the seed from pushing through. When the soil is too dry, the best plan to adopt is to give it a thorough drenching one or two days previous to the time of sowing. On the other hand care must be taken that the soil is not too damp, otherwise, in all probability, the seed will rot instead of germinating.

All seeds should be sown in drills, for not only is there a saving in the quantity used, but less labour will be required in cleaning and thinning the crop. Early sown crops should not be covered so deeply as those sown later when the great excess of moisture has evaporated from the soil. Large seeds like Peas and Beans may be covered about 2 inches, smaller seeds from $\frac{1}{4}$ to 1 inch, making some allowance for the condition of the soil when sown. For instance, when sowing Early Peas, unless the site is naturally very dry, it is better to sow in the surface soil than to lay the seeds in a wet stagnant medium, where the plants, when they do struggle through, will be weak and spindly in their growth and incapable of withstanding any excess of moisture or drought, whilst successional sowings, when dry weather may be shortly expected, will thrive better in deep drills or trenches, as by such a course they are enabled to obtain a greater amount of moisture for a longer period, and besides when artificial waterings are necessary, the moisture will be more easily retained round the plants. Although it will be desirable to sow as nearly as possible on the dates that will be hereafter given (making some allowance from the climate of the place in its relation to latitude and other special circumstances, such as shelter and elevation, which have in some instances a great influence on the growth of early vegetables) yet when dates are given for planting or sowing of certain crops, it should be understood that they are

always to be subject to the weather and to the natural conditions of the soil. During an experience of many years, I have always found that by waiting and watching and seizing a favourable opportunity when offered, a good seed time could generally be secured. In dealing with heavy land, I have derived great advantage from having a heap of light rich compost in which the charred remains of the rubbish heap form a considerable portion, to cover all small seeds. This is a matter that calls rather for forethought than extra labour, and the benefit derivable therefrom will be found to be great when one has to deal with a heavy tenacious soil ; it is also a great consolation to feel that reliance may be placed upon every good seed growing, even supposing that extra trouble has been incurred. We have frequently heard complaints of flower seeds not growing when sown in the open borders, and the seedsman blamed for supplying bad seed when really the fault has been in the way the ground has been prepared and the seed has been sown. Sow only when the land is in good condition to receive the seeds, even if you have to delay a week or even a fortnight for a favourable opportunity, for there will then be no difficulty in procuring a good crop of plants. Sow THINLY—for when you have bought reliable seeds there is a waste both of seeds and time in thick sowing. Commence thinning the young plants early, and examine them two or three times before that operation is completed, all that is necessary to guard against being over-crowding from thinning being too long delayed. A crop neglected in this particular never turns out well.

The proper covering of seeds is a vexed question that has hardly yet been settled by men of science, while almost every practical man has his own rule of thumb modes and degrees of covering. Two facts, however, are brought out very prominently. One is, that seeds are long suffering in the matter and will manage to grow at various depths from nudity to several inches of earth ; the other is, that most seeds are covered to excess. All covering is, in a sense, unnatural—Nature sheds all her seeds on the surface, though by various devices she often contrives to bury them to a greater or less depth. This is at least a strong argument for flat sowing. The depth of one or two diameters of the seeds is a rule which may be applied with safety to all seeds. For one seed that perishes from exposure to the air, probably a thousand are buried alive under an impenetrable barrier of earth.

The protection of seeds is the last and one of the most important points about their sowing. It seems as if it were forgotten at times that seeds are sown to grow, and not merely to get rid of them ; for they are not seldom cast into beds already crammed full of the seeds or roots of weeds and the germs and perfected forms of slugs, grubs, worms, and other insect pests. The first are ready to smother the garden seeds in the germ, the last waiting to

devour the first growth of the seeds and eat up their substance bodily. Almost as well cast valuable seeds into the sea, as into such nests of weeds and dens of insects. Seeds should be protected from all such danger by insuring that the beds are clean before they are cast into them. The seeds may also be protected by various dressings so as to make them invulnerable to the attacks of insect pests below, and birds or other seed pilferers above ground. Sprinklings of parafin oil have proved effective for both purposes. This oil, however, varies so much in strength, that unless it is carefully used, it kills the seeds while rendering them unpalatable. The simplest and surest remedy is a coating of red lead round the seeds. The easiest mode of applying it is simply to wet the seed and dust it with dry lead turning over the seed until the whole is coated. It is thus impregnable as the old warriors in their iron coats of mail--nor slug, nor bird, nor mice will touch it, while the lead neither hinders germination nor weakens the vital power of the germ.

All kinds of seeds that are sown in beds and transplanted to permanent quarters, should not, on any consideration, be allowed to get drawn or starved in the seed beds. If the ground be not in readiness for their reception, as soon as large enough, they should be pricked out in nursery beds and carefully removed afterwards. One rule should be followed with all crops, that is, to drill all seeds and to plant all plants in straight lines of equal distance apart each way, not only for the sake of appearance, but for the expeditious manner in which the operation of cleaning the crops may be performed compared with broad cast sowing. Immediately the lines of seedlings are visible, run the hoe between them, which not only destroys all weeds, but greatly encourages the growth of the crop. I cannot too strongly condemn the practice of mixed cropping, or sowing two crops together, such as Lettuce and Parsley, amongst Onions, and Beans amongst Potatoes: this is of itself enough to give a weedy self-sown aspect to the best crops, and no advantage is thereby gained. It is quite distinct from intermediate cropping, which in some cases is highly favourable to both. Parsley, herbs and salads that are in daily demand, should be grown on narrow beds or borders, clear of the walks, but convenient for gathering. As regards varieties, I should not recommend an experimental system of growing all new kinds, as the most likely to furnish a constant and reliable succession, nor yet be prevented by prejudice from adopting any real improvements. I would rather recommend a few of the most promising kinds to be tried each year, and select from them for permanent varieties when convinced of their superiority by comparison of growth and suitableness to locality. Exhausted crops should be cleared from the ground immediately, as by making surplus growth they not only rob the land to no purpose, but give an impression of dismal desolation and decay,

which should be as much avoided in the Kitchen Garden as in that portion of the grounds devoted to ornamental gardening. Neither is there any gain as regards economy of labour, in neglecting neatness and order : the difference between a garden kept systematically clean and one where weeds ran to seed, can only be appreciated by those who have tried it.

These instructions in seed sowing may read somewhat tediously, but they are simple and easy in practice ; and if generally carried out they would go far to abolish the perpetual grumblings about bad seeds, and to prevent those failures of crops which are among the greatest drawbacks to the pleasure of gardening. It is hardly too much to assert that nine out of ten of these failures arise from bad sowing rather than worthless seeds.

ROTATION OF CROPS.

It is not an easy matter to lay down suitable rules for any regular system of cropping small gardens, and even when the plan is decided on, it is still more difficult to carry it out, where close and continuous cropping is the order of the day. It is not like cropping a farm on the four course system, where every year's crop, like a piece of well fitting machinery, is made to dovetail into the next; but there are certain general principles that must not be lost sight of, although it may not at all times be possible to carry them out. There are some crops—such as the cabbage tribe for instance—that may be termed exhausting crops, and these should never be planted on the same land two years in succession. Others again, such as Celery, Peas, and Onions, that usually have the land highly manured before planting, leave it in a much less impoverished condition, Onions having been successfully grown on the same land for many years.

I do not recommend it as a good practice, but in small gardens it cannot always be avoided ; but much may be done to mitigate any bad effects arising from this course by a frequent change of seed. Where deep culture is systematically carried out, and where the manure supply is ample, the constant and complete rotation of crops loses some of its importance. Still, even where these advantages are always present, no two crops of allied genera should follow each other in direct succession, if it be possible by any means to avoid such an arrangement. It has never been satisfactorily explained on scientific grounds why a rotation of crops is necessary ; but that it is necessary, and absolutely so, nobody for a moment doubts—the evidence on that head is too conclusive.

Physiologists at one time supposed that plants threw off some kind of excreta from their roots which were injurious to after-crops of the same kind ; but it being found that plants in a heal-

thy state did not excrete any substance whatever, this hypothesis was given up as untenable. The next and most plausible explanation is, that by cropping the ground often and repeatedly with the same kind of plant, we exhaust the soil of the food which that species requires—starve it, in fact. No doubt this practice does impoverish the soil; but experiment has demonstrated that the supposed exhaustion may be made good without any disadvantage if rotation be neglected; and this is about as much as is known at present. The uncertainty which exists on this point need not, however, effect our practice very seriously, or hinder a well tried system of rotation from being carried out.

The common rule with cultivators is to let each crop be as unlike that which has occupied the ground before as possible. If this cannot be managed—if Cabbage must follow Cabbage, Greens, or Turnips—or any of the Brassica tribe, for example—then the only plan is to trench the ground 2 or 3 feet deep, and manure as liberally as can be afforded. I by no means wish to convey the idea, however, that crops will absolutely refuse to grow, or that they will seriously fail, if the same kind of crop occupies the same ground for a few years in succession, without its being more than simply dug and manured. Plenty of people are obliged to plant their vegetables on the same piece of ground for years together, and yet they secure very fair crops; but the returns grow less and less annually. Fortunately for many, the potato submits to the repetition system better than most vegetables. Provided the ground be fairly manured annually, it will produce good crops for a number of years.

To attempt the practice, however, with such subjects as the Kales, Carrots, Onions, Peas, Beet, Parsnips, &c., would be very unwise. The rule laid down for our guidance, *viz.*, that plants of the same order should not succeed each other, is rather too vague for practical purposes; but the following directions as to change of crops will meet the wants, in most cases, of those who have to crop their garden ground economically and as cultivators have often to do, on the mixed system; that is cropping between the rows of main crops with other things—as for example, sowing Spinach, or planting Cauliflowers between rows of Peas or Celery, &c.,—a common practice in almost every garden. Acting on the hint already given, that each crop should be as unlike the preceding one as possible, it of course follows that root crops should not follow root crops, but *vice versa*; neither should very exhaustive crops follow each other, but a partial rest should, as far as practicable, be given to the soil by following a heavy and exhaustive crop with a light one. None of the Brassica tribe should follow each other, but they may succeed Beans, Peas, Potatoes, Onions, Celery, Beet, Parsnips, or Carrots. Peas may follow any crop but those of the Leguminous class, and may particularly follow Potatoes or other

root crops, Onions and Celery. Onions and Leeks usually succeed Celery, the ground being as a rule well manured for the last crop and just in condition for Onions. Beans and Kidney Beans may, like Peas, follow any crop not belonging to the pod-bearing class, and may be succeeded by any of the *Kale* tribe—Beet, Spinach, or *any* spindle-rooted crop. Carrots may follow any but root crops, or Parsley. Spinach may succeed, Peas, Beans, Potatoes, Onions, Lettuce, or any crop, but those of the top-rooted section, especially Beet, to which it is allied. Seakale may follow any crop, but those of the Cabbage tribe. Shallots and Garlic the same as Onions. Lettuce and Endive may almost follow any crop, being shallow-rooting plants and greatly influenced by the way in which the ground is dug. Celery, owing to its peculiar nature, may succeed any crop, whether belonging to the same order or not; the ground being dug, specially manured for it and deeply turned up, it is not affected by the previous crop. Turnips are benefited by rotation more than almost any other crop, and should never follow any of the crucifers within two or three years, unless the ground can be well trenched and manured. Potatoes do well after Peas, Beans, Celery, Spinach, or any other crop, but manure must be applied according to the exhaustive character or otherwise of the preceding crop. These directions, we are aware, can only be partially followed out in any garden, but they indicate the course to be pursued as opportunity affords.

WATERING AND MULCHING.

Even in the best arranged gardens, irrigation has generally been looked upon as a matter of quite secondary importance, and it is very rarely that we meet with a thoroughly well arranged system whereby crops can be quickly and efficiently watered. There is no questioning the fact that if a good supply of water in a Kitchen or front garden could be easily applied, it would double the produce, and unless there are facilities for doing it thoroughly, it would be better to divert the labour attendant thereon into a channel calculated to mitigate or counteract the effect of a long drought. Watering on the surface only, without giving sufficient to reach the main roots, is of very doubtful utility even when it can be applied every evening; but if it can be done only occasionally it is worse than useless, because it tends to draw the roots to the surface, and when the water is withheld they perish. I have already referred to deep culture as a ready means to enable vegetables of all kinds to withstand drought, and mulching as a preventive is of the greatest utility. Half-decayed manure is the best material to employ, as it not only checks evaporation in the most efficient manner, but it also enriches the soil, as all water falling over it carries the ammonia to the roots of the plants; it may either be spread on the surface about two inches

thick, or, where its appearance may be objectionable, covered with loose soil. Grass or litter of any kind may also be usefully employed in the same way, where irrigation is not available and all watering has to be done by hand. Whenever it is decided that any crop must be watered, let it be done in the evening and thoroughly; and if the surface cannot be mulched, loosen it with the hoe the next day. When watering must be done by hand, I prefer to water for two or three days in succession and then leave the crop unwatered for two or three days, at the same time using the hoe freely where mulching is impossible.

HOEING.

The hoe is perhaps on most soils the most useful implement in the garden. Hoes are made of various shapes, but two only need now be alluded to, viz., the Dutch hoe and the draw hoe; the former is best adapted for earth-stirring purposes or destroying weeds, and the latter for drawing drills or drawing earth up to the stems of crops. During fine weather, when the surface is dry, the Dutch hoe should be constantly in use, not only for the purpose of destroying weeds when they are small and easily eradicated, but also to keep the soil in loose friable condition so necessary for the encouragement of rapid growth in vegetables. The surface should be thoroughly broken up about two inches deep. It is a waste of labour to let the hoe slide over the hard crust, as some men do if left to themselves, and then call such a mere surface tickling hoeing. When soil becomes hard on the surface it parts with the moisture much more rapidly, as well as ceases to attract moisture from the atmosphere in the same way as a loose open surface. The only difficulty in the way of the more general use of the hoe in this country is the very strong objection that our native gardeners have to it. The old-fashioned system of weeding and loosening the soil with a small hand instrument has become so imbedded into their nature, that it frequently requires no small amount of coercion or moral persuasion to induce them to adopt any other method; if owners of gardens studied their own interests they would discard every native tool, with the single exception of the *kodallec*, and enforce the use of English implements, by which not only is work done more thoroughly but much more expeditiously.



Descriptive List of Vegetables, WITH CULTURAL NOTES.

ARTICHOKE (*Cynara scolymus*) VERN, HERN HATHICHUK, HURSHUF.

ALTHOUGH this plant is naturally a perennial, it can only be cultivated as an annual with any amount of success in the plains. It is, therefore, necessary to sow the seed as early as possible. This is best done in seed-pans or boxes about the middle of August. The seed, if good, will germinate in ten or twelve days. As soon as this occurs, they must be allowed as much light and air as possible. It is, therefore, advisable to place the boxes or pans in the open air during the continuance of fine weather, and only removing them under shelter when it is raining heavily, as the plants, in their young state, are very delicate; and if subject to any excess of moisture, are apt to damp off. If the seedlings come up too thickly, they should be thinned out and planted in other gumlahs. As soon as the plants are five or six inches in height, they may be put out in the ground prepared for them. Great care must, however, be taken in removing the plants that the tap root is not broken, otherwise they will receive a check which it is difficult for them to recover from.

The soil in which they are grown can hardly be made too rich. The plan most generally adopted is to dig trenches at a distance of three feet apart, and after thoroughly pulverising the soil to a depth of two feet, a heavy dressing of rich manure should be given. The plants may then be placed in the trenches at intervals

of two and a half or three feet, and must be kept well shaded till established. Water must be liberally supplied through the whole period of their growth, and they will also be much benefitted by frequent dressings of strong liquid manure. In Europe, the Artichoke is generally propagated by offsets or suckers from year to year; occasionally this method is adopted here. With a little care, old plants may be kept through the rainy season. There is, however, but little advantage gained by doing so, as, although the heads may form earlier, except under very careful treatment, they are always inferior to those produced by seedling plants when well grown.

Firminger, in his "Manual of Gardening," states that in the neighbourhood of Calcutta only what is called acclimatised seed can be used with any prospect of success, as it is very rare indeed that a single head can be obtained from plants raised from "imported seed." In direct contradiction to this, another well known authority "Lundolicus," says "the seed of the Artichoke is best imported from France, England or America." "Country seed is easily obtained, but can never be relied on, as it frequently yields worthless flowers." My experience certainly coincides with the latter. On more than one occasion I have had plants raised both from English and acclimatised seed, growing side by side, under precisely the same treatment, and the former has invariably produced the finest heads.

Culture in the Hills.—Seed may be sown at any time from March to May, (but it is not advisable to plant out the seedlings before the commencement of the rains,) they will not of course produce any flower heads till the following season. Globe Artichokes will succeed well in any deeply-stirred, well-enriched soil, and they are not nearly so tender as the mode of culture in vogue with our fathers would lead us to expect. A little dry litter or fern placed round each plant before frost has set in, is all the protection they need in most situations; ashes or burnt earth packed round the collars of the plants will answer the same purpose. New plantations are best made from offsets taken from old stools in March or April. If a piece of the old root can be taken off with them they will establish themselves in less time, and some of them may produce a few heads in the autumn. Plant rows 3 feet apart and every year afterwards, until it is necessary to replant, all the weak offsets or shoots that spring up round the sides of the main stems should be removed in spring, as they do not produce any flowers, and only tend to weaken the plants. The undeveloped flowering heads, when getting firm at the base, are the parts usually eaten. The young leaves that usually shoot up towards the end of August are sometimes tied up and blanched like Caroons. This, however, is not often practised, except in the

case of old plants which it is intended to destroy. All stems from which the heads have been cut should be removed at the same time, as they only tend to exhaust the plants if allowed to remain. It is hardly advisable to allow them to occupy one position too long, as they are strong-rooting plants; and when the soil is exhausted they quickly show signs of deterioration, both in the size of their globular flower-heads and in the loss of their perpetual bearing habit; but the latter fault can in some measure be rectified by severely thinning out the flower-stems when they first appear, so as to induce them to throw up a succession. Salt sprinkled amongst the plants during the spring months will be exceedingly beneficial to them. Mulching also, with occasional doses of liquid manure, will encourage the production of very fine heads.

The following are the most popular varieties—

LARGE GREEN GLOBE—Globular heads, the best for general cultivation.

LARGE PURPLE PARIS—Oval heads; a much esteemed variety.

LAON OR PARIS GREEN—A variety much grown in France, very large.

NAPLES LARGE GREEN—Of delicious flavour, the best.

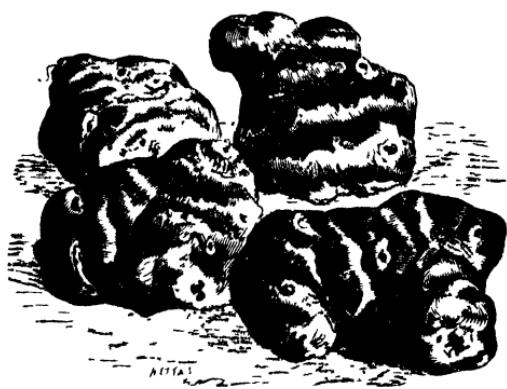
SICILIAN MARROW—A highly recommended Italian variety of quick growth and matures early, heads very large,—tender and fleshy, of the most delicate flavour.

NEW EARLY VIOLET CAMPANIA.—A very fine new variety from Italy, where the Artichoke is a favourite vegetable. The flower heads are formed early, are thick, fleshy and of rich flower.

JERUSALEM ARTICHOKE (*Helianthus tuberosus*).

This is a very useful vegetable, and is much cultivated in

some parts of India where potatoes are not procurable at the time it is in season. The tubers should be planted in April or May in the open ground, in rows two feet apart and eighteen inches between the tubers, and about four inches deep. If grown in a good rich soil, no manure should be given them, as it often



JERUSALEM ARTICHOKEs.

has the effect of causing them to form too much stem instead



ARTICHOKE—LARGE GREEN GLOBE



ARTICHOKE—SICILIAN MARLOW

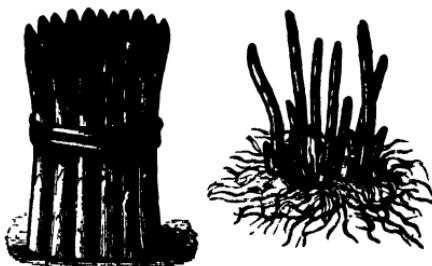
of producing good tubers. They will be ready to take up by the end of October, and as soon as they are dry, should be carefully stored in sand or earth, as, if exposed long to the air, they invariably shrivel up and become useless.

ASPARAGUS (*Asparagus officinalis.*)

VERN, SOOT MOOLEE, MURCHOBA OR PALAGRAS.

One of the most delicious of all European vegetables, and although extensively cultivated in this country, the produce is of very inferior quality as compared with that grown in Europe, not only in point of size, but also flavour. This is probably more owing to the want of care bestowed on its cultivation than to the difference in the climate. There is certainly no vegetable that will repay good cultivation better than Asparagus. This was clearly proved at a recent show held at Tunbridge Wells, where special prizes to a large amount were offered for the best exhibits of this esculent, the leading class being for three bunches, each containing one hundred heads. The first prize exhibited in this section weighing upwards of thirty-seven pounds, or an average of about two ounces for each head. Although it may be out of the question for us to attempt to grow anything approaching this, still much can be done to improve the pipe stem style of growing that is so generally seen amongst us.

It is impossible to make land too good for Asparagus if large heads be desired, though those of medium growth are equally good in every respect except size. I have often heard the remark made by occupiers of a small plot of ground, that they should much like to have an Asparagus bed, but have been deterred from planting one on account of the expense. Of course it is possible for Asparagus beds to become very expensive, but it is by no means a necessary accompaniment, for it need not cost more to prepare the land for Asparagus than for Onions, or any other crop that requires high culture. It is not a crop that can be sown and gathered the same year, and to a certain extent that, no doubt, is a drawback; but even granting that three years must elapse before many dishes can be cut, if fairly treated afterwards it will continue to produce Asparagus in a satisfactory manner for many years with little cost.



A light, rich, sandy loam, of an alluvial character, is the best soil for Asparagus, but any soil, if well treated, will produce good-flavoured heads. As a rule, the quicker the growth the better and more tender will be the produce; this remark, however, most assuredly applies to other vegetables, for all are produced in greater perfection in a rich, highly manured soil. Asparagus is a strong-rooting plant, and if planted thickly must be liberally fed, and, when crowded together in narrow beds, as is frequently the case, if not treated liberally, the soil is soon exhausted, and the produce becomes weak and poor; but give it as much room as the roots can occupy—taking into consideration that it is a perennial, the spread of whose roots and branches will increase annually for many years if fairly tended—and this exceptional manuring for Asparagus need not be so rigidly insisted on. I contend that if other crops were crowded together so closely in proportion as Asparagus generally is, the result would be so unsatisfactory as to suggest the cause of the failure and its remedy at the first glance, but as Asparagus is a long-suffering plant, sufficient notice is not taken of it; and when plants die off in the thickly-planted beds for want of light and air, excessive planting is one of the last things suspected as in any way conductive to the shortness of the crop.

Seed should be sown at any time from July to September, either in boxes pans or pots and kept well sheltered from heavy rains, the soil in which they are sown should be light and porous, as otherwise it will be found very difficult to transplant the young seedlings without injury. In favourable weather fresh seed will sprout in two weeks from the time of sowing. Seed older than one year will take longer to germinate, and, if more than three years old, it is unsafe to sow it; there is no prospect of its ever germinating. In case the seed is older than one year, soaking it in milk twenty-four hours before sowing will cause it to germinate sooner.

In about three months from the time of sowing the plants should be large enough to be transferred to their permanent quarters, if however space is an object, they may first be planted out in a nursery bed about 9 inches apart each way, and if liberally treated will make splendid plants the following season. In Europe and America, plants are rarely put out before they are one year old, experience having proved that these give better results than younger seedlings.

PLANTING.

Every one has his own mode of planting, In France, the general practice is to trench the bed 2 ft. deep, removing entirely

1 ft. of the soil, and laying it in a ridge beside the bed. Plenty of manure is then added to the remaining soil; the roots are planted 2 in. deep and 1 ft. apart, in rows $1\frac{1}{2}$ ft., asunder; and every year a layer of manure, and 1 in. in depth, of the surrounding soil, is thrown on the bed, so that when the bed is made level the roots are still sufficiently deep. During the third season a few heads are cut. London market gardeners plant the roots 1 ft. or $1\frac{1}{2}$ ft. apart, in rows 2 ft. or $2\frac{1}{2}$ ft., asunder. The beds, which are 3 ft. wide, consist of two rows, each bed being separated from the other by a footpath or alley 2 ft. in width. Every year the soil of the footpath is thrown over the bed, and in autumn immediately after the dry stems are cut, the soil is again taken off the bed and thrown into the alley. Under this system Asparagus of a medium size can only be obtained; but now-a-days people want

LARGE ASPARAGUS,

which may be secured as follows:—Select a piece of ground for the beds of good quality; trench it thoroughly 2 feet deep, carefully removing stones, roots, and anything else which may be injurious to the roots; mix with the soil plenty of manure or compost. In February, should the weather be favourable, form the ground in ridges 4 feet wide and 1 foot high, and in March or April, according to the weather, make a trench between each ridge a few inches deep, and plant on little hills or elevations 3 feet apart, cautiously spreading out the roots, and covering them with 1 inch of good compost; then add an inch of fine soil. A stick should be inserted to protect the roots and to which the small stems can be fastened when they require support. Keep the ground clear of weeds and destroy all slugs, snails, and Asparagus beetles; the latter lays its eggs on the stems, and when the larvae are hatched, they destroy the young plants. Hoe the ground over as often as may be required, and water two or three times during the summer with liquid manure if needed; never intercrop with any other vegetable. In the autumn, when the stems have withered, cut them down to 1 inch or so of covering and put a layer of old manure or compost from 3 inches to 5 inches deep over the roots.



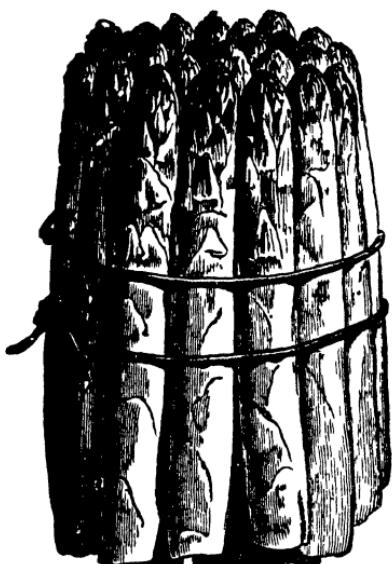
SECOND YEAR.—In February or March fork up and level the bed, leaving the roots about 5 in. or 6 in. of covering, or make small hills 5 in. or 6 in. high over each plant. Make good any plants that may have failed, and cover the whole bed with a layer of rotten manure or compost 3 in. or 4 in. thick ; this will keep the soil in good heart and in an equable state as to moisture, therefore no more watering will be required ; destroy weeds and insects, and tie the stems to their sticks in order to prevent the wind from shaking the roots. In autumn cut down the dry stems to a few inches above the ground ; again make up the ridges, leaving the roots 1 in. or $1\frac{1}{2}$ in. deep, and over all put as much manure as you like.

THIRD YEAR.—In February level the ground as in the preceding spring, and remove what was left of the stems, over each plant put a little hill of soil, and sticks will be no longer wanted, as the stems will now be sufficiently strong to resist the wind without support. A few heads may this year be cut for use from each plant. The cutting time being over, the bed may be levelled if preferred ; every autumn, apply plenty of manure, and every spring mulch between the hills with fresh manure to prevent the soil from becoming hard. Salt dissolved in water and applied in spring will be found advantageous ; but be careful about applying chemical manures, which often prove fatal to the plants. All seeds should be picked off as

ASPARAGUS—ERFURT GIANT.

early as can be done ; do not let them fall on the ground in autumn, otherwise a quantity of useless young plants will appear to the detriment of the bed.

The distances at which the plants stand apart may appear too great, but wide planting is the only secret as regards getting fine Asparagus ; besides, the number of heads produced are double, and their size three or four times larger than they otherwise would be, thus showing a large balance in favour of plenty of room. The celebrated Argenteuil Asparagus, so largely imported to Covent Garden, is grown in a way similar to this. Seed should be sown



in the Hills during March or April, in all other respects the culture will be the same as described above.

VARIETIES.

ARGENTEUIL—The finest purple variety.

CONOVERS' COLOSSAL—Large and vigorous; colour deep green.

EARLY GIANT PURPLE—A robust variety of the most delicious flavour.

ERFURT GIANT—A well known good old variety.

GIANT EMPEROR.—This is a selection from the celebrated Conovers' Colossal, closely resembling that variety but under good culture assuming mammoth proportions and yet at the same time retaining the delicate flavour of that esteemed kind.

BARR'S MAMMOTH.—A splendid variety of American origin, it is of very fine flavour, the shoots being very tender, almost to the stem; it is one of the finest and handsomest varieties grown, as well as the most productive.

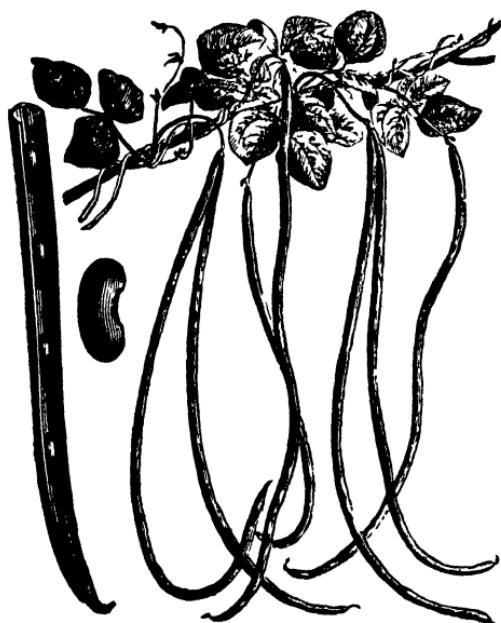
PALMETTO.—Another American variety of great merit, it is described as being of enormous size, very even and regular in growth, and the best flavored of all varieties, this variety is gradually taking the place of that good old kind Conover's Colossal, with the leading American growers, being far more prolific and coming into season earlier and lasting longer than that variety.



ASPARAGUS PALMETTO.

LONG ISLAND GIANT.—This is probably another unproved variety of Conover's Colossal—it is now entirely superseding that variety with American growers both for the home markets and for canning, it is described by the introducers as producing tender heads fully 12 to 15 inches in length and from one inch to an inch and a quarter in thickness.

ASPARAGUS BEAN (*Dolichos vars.*),
 VERN.—BURBUTEE, LOOBEEA, PAUTI, SHWEET SEEM.



ASPARAGUS BEAN.

There are several species of this vegetable nearly all of which are indigenous to this country, the most generally cultivated is *Dolichos Chinensis*, a very strong growing variety reaching a height of 12 to 15 feet; seed should be sown in May or June, and will produce a succession of crops throughout the rainy season. The pods should be gathered when about 8 or 10 inches long when, if properly cooked they are almost equal to French Beans in flavor.

Dolichos Cubensis.—The Cuban Asparagus Bean is a vast improvement on any of our indigenous varieties; flowers are of medium size, greenish white, succeeded by pods of remarkable length frequently 30 inches when fully grown, but it is not advisable to allow them to attain anything like maturity, as the pods then become hard and stringy.

BROAD BEANS. (*Faba Vulgaris*).

VERN.—SEEM, SHIEM, BEAN.

It cannot be said that the cultivation of this fine old vegetable is attended with unqualified success in many districts. Frequently, from some unexplainable cause, although plants may thrive vigorously and bloom freely, they obstinately refuse to set a single pod.

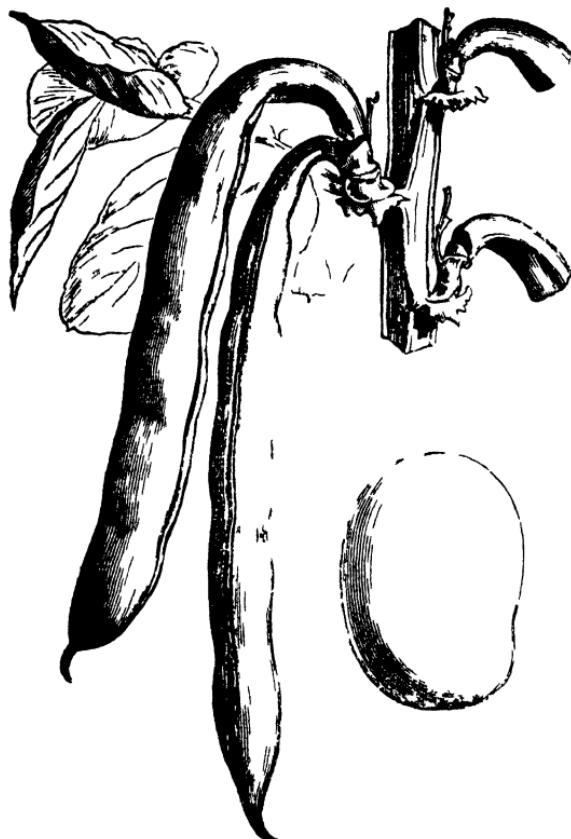
They succeed best in a deep, stiff, loamy soil with a moderate amount of well-rotted manure added. The seed should first be steeped in warm water for about twelve hours, otherwise they will take a very long time to germinate. The sowing should be made in October, as early as possible after the rains, in drills about eighteen inches apart; the seed should be planted about two inches

deep with a space of four inches between them. As soon as the plants have ceased blooming, pinch off about two inches of the top; this will induce them to set more freely, and an occasional syringing during the time they are in bloom will also conduce to the production of pods. Some authorities recommend sowing the seed in boxes or pans, and as soon as they are two or three inches high, transplant them into the open ground. One advantage gained by this method, is that the crop grows more uniformly, and it is also stated that the fruiting is thereby considerably accelerated.

In the Hills at an elevation of 5,000 to 8,000 feet these succeed splendidly, sowings may be made at any time from March to May.

VARIETIES

BUNYARD'S EXHIBITION LONG POD



BEAN BUNYARD'S EXHIBITION

GIANT SEVILLE LONG POD. A very fine long podded variety growing 10 to 12 inches in length very prolific

JOHNSON'S WONDERFUL A well known old variety

This is undoubtedly the finest and most productive Long Pod Bean I have ever seen, the stems being covered with handsome pods containing seven and even eight beans in each. I can strongly recommend this as a most valuable introduction.

AN ADULT

GIANT—Very long podded, most prolific and of exquisite flavour, fine for exhibition

ITALIAN MAMAGON—The curliest variety, beans very small

HARLINGTON WINDSOR—An improved variety with very large pods

MACKIE'S MARCH—A highly recommended variety, the best for general crop

DWARF OR FRENCH BEANS.—(*Phaseolus vulgaris*).

VERN.—FRAS SEEM, CHOTA SEEM.

What we term French Beans—the Haricot Bean of the French—are not of French extraction, but come from *Phaseolus vulgaris*, a native of India, which is mentioned as being in common cultivation in England in the year 1597. Phillip Miller of Chelsea, in the edition of his *Gardener's Dictionary* published in 1731, devotes a good space to the genus *Phaseolus*, and states that it takes its name from a Greek word meaning a long and swift ship, because the husk of the fruit or pod resembles such a ship.

It is difficult to discover any reliable information as to the origin of, and the times when, the leading varieties of the dwarf French or Kidney Beans were introduced to commerce. The earliest seed catalogue I can put my hand on—that of James Carter, 238, High Holborn, published in 1842—simply states, “Kidney Beans, dwarfs and runners, in sets,” and this practice of cataloguing appears to have been common at that time. In Messrs. Peter Lawson & Son’s seed list, published in 1852, there is a list of varieties of dwarf Kidney Beans, and the Dun, Negro, Canterbury, Fulmers’ Early, and Wilmot’s Early, appear in this list. As far back as 1836 I find that the light or Early Dun, and the dark or liver-color Dun, were mentioned as early varieties, very hardy and productive; the dwarf Negro, or Black Kidney Bean, “as much esteemed both in this country and the Continent for its green pod,” an opinion quite as freely held at this distance of time—more than half a century; and the Negro was at that time very much used for food by the black population in the Brazils. The dwarf Canterbury, with its small clear white seed, was then as now a well-known dwarf early sort, but rather unproductive in some cases; still it is an esteemed sort for an early crop, the young pods being very tender. Fulmer’s Early was also in cultivation then, but Wilmot’s Early appears to have been a later introduction; and both these are little grown in our days, except by some of the older school of gardeners.

There are now a great many varieties of dwarf French Beans. The Royal Horticultural Society’s recent trial of dwarf Beans at Chiswick included forty-two distinct varieties, many of which were received under almost innumerable synonyms. It is worthy of notice that Kidney Beans are in increased demand every year; and it is believed that the increase, though owing to a great extent to the growth of the population, is also occasioned in part by a greater appreciation of Beans as an article of food.

In the North Western Provinces and Punjab sowings may be made by the end of August but in Bengal it is hardly advisable to do so before the middle of September and even then it would be better to wait a few days if heavy rains prevail. They should be sown in a moderately shady position; if fully exposed to the sun they not only grow slowly but almost invariably become infested with a kind of fly that destroys them in a few days. The seed, if good, will germinate in from four to seven days and the plants of the earlier varieties should be in full bearing in six to seven weeks from the time of sowing. Sow in the Hills from April to June and again from August to September.

The number of kinds in cultivation are now very numerous, but the following selection will be found to embrace variety sufficient for all practical purposes.



DWARF BEAN, THE SHAH.

EMPEROR WILLIAM.—A very fine new variety of great merit, enormously prolific, and of the very best quality, I cannot recommend this too highly.

THE SHAH.—This belongs to the "Negro" class but is quite distinct in growth from that variety, as will be seen from the illustration, this is undoubtedly the most prolific of all green-pod beans, the plants continuing to bear through the entire season if care is taken to remove the pods directly they become fit for use.

English Varieties.

CANADIAN WONDER.—This is without doubt one of the best Dwarf Beans, producing pods 9 to 12 in. in length, which when boiled are very tender.

CHEVRIER'S FLAGOULET!—A new continental variety of great merit. Seeds and pods, brightgreen which retain their colour when cooked.

CARTER'S LONGSWORD.—A very vigorous variety producing very long straight pods in the greatest profusion.

GREEN GEM.—A very fine new variety belonging to the Flageolet class, very vigorous in growth and enormously prolific, pods long and fleshy, deep green, retains its bright colour when cooked.

McMILLAN'S PROLIFIC.—A splendid main crop variety, very hardy and prolific, pods of medium size and excellent flavour.

MONSTER LONG-PODDED NEGRO.—Awarded *First Class Certificate* by the Royal Horticultural Society. One of the most valuable varieties. robust habit, pods 7 to 8 inches in length.

NE PLUS ULTRA.—Quite distinct in seed to any other variety; habit dwarf and compact; very delicate in flavour and very early. It is enormously productive.

SIR JOSEPH PAXTON.—A well known and highly esteemed variety; pods large and fleshy, very prolific.

WILLIAM'S EARLY PROLIFIC.—A very early and prolific variety, of excellent quality, seeds and pods marked with violet.

BLACK WONDER.—A variety somewhat resembling the Negro, but ripens fully ten days earlier.

BEAN, DWARF BLUE POD BUTTER.—A very striking Novelty and quite distinct from any other variety in cultivation. The compact bushy plants grow uniformly to a height of about 12 inches and are extremely ornamental; the leaves and stems being of a bright purple colour which becomes more intense as they advance in growth, and form when covered with the pinkish purple flowers and deep blue pods, a most showy object. The entire pods cook a rich green, it is besides the sweetest flavoured of all string beans and immensely prolific.

American Varieties.

EARLIEST RED VALENTINE.—This variety is at least 10 days earlier than the early Red Valentine, and is usually ready to pick in 35 days from the time of planting. On account of its great earliness it is largely grown by market Gardeners, but except in the characteristic of extreme earliness, it differs in no other way from the Early Red Valentine next described.

EARLY RED VALENTINE.—Desirable for either Market or family use, being early, productive, tender, and of excellent flavour. The pods are round, somewhat curled, and the seeds, when ripe, salmon speckled with purplish rose.

BEST OF ALL.—This superb variety originated in Germany, and, while it had been grown for some years around New Orleans, was offered in the North for the first time in 1886. The pods are 6 inches long, very fleshy, succulent, stringless and of rich flavour; they are produced early and abundantly. Altogether it is one of the most valuable green-podded beans for market or family use.

REFUGEE OR THOUSAND TO ONE.—A very productive medium or late variety. The young pods are tender and of fine flavour. This variety is extensively grown for pickling. Seeds dull yellow speckled with purple.

EARLY MOHAWK.—Very early and will stand more cold than most of the bush varieties.



DWARF BEAN, LARH'S R'D VALENTINE



DWARF BEAN, BEST OF ALL

DWARF BEANS.—WAX POD VARIETIES.

This is a comparatively new class that is gradually but surely gaining in popularity and must eventually supersede all other varieties, they have already become established favorites throughout America and also on the Continent of Europe. The pods are generally of a beautiful waxy yellow colour, entirely free from strings and when cooked are of a rich buttery flavour entirely distinct from any other species of Bean in cultivation. These should be sown rather later in the plains than the ordinary dwarf varieties as they thrive best in a cool dry atmosphere. In the Hills they grow with wonderful vigour, seed sown in April if kept liberally supplied with water will produce three or four crops in succession if each crop is removed as soon as the beans are large enough for use. The following list embraces all the best Continental and American varieties.

DWARF WHITE WAX.—Similar in every respect to the Dwarf German Wax ; the pods are, however, not quite so round, and the bean is pure white when ripe. Highly recommended.

EARLY DWARF GERMAN WAX.—The finest of all, pods transparent, waxy yellow, and snap like pipe-stems, boil as rich as butter, and, when highly seasoned, are luscious : they are thick and very tender, entirely stringless, and fully as early as the Valentine ; one of the best market varieties. The bean, when ripe, in black.

EMPEROR AUGUSTA.—A splendid new variety, very early, good flavour and exceedingly prolific.

MONT D'OR.—An extra early and very productive new dwarf butter bean. The pods are very numerous, 3½ to 4½ inches long, of pale yellow color, very fleshy excellent in quality.

FLAGEOLET WAX.—Somewhat resembling the preceding, the pods are, however, longer and the plants most prolific.

DWARF BUTTER WAX, BISMARCK.—This variety, is one of the most attractive and famous varieties of Wax Beans known in Germany. It is very early, the pods which are produced in great profusion, will average six inches in length, are almost transparent, exceedingly brittle and of very delicate flavor : the bean when dry is of a beautiful bluish black color and of a kidney shape.

CRYSTAL WHITE BEAN.—Although quick to mature, they are slow to harden, retaining their juicy, succulent flavor for some days after they are ready to pull. The pods are ivory white, small size, round and very fleshy, with small white seed.

GOLDEN WAX.—One of the best dwarf beans : earlier than the ordinary Wax. Pods are large, long, brittle and entirely stringless, of a rich golden wax color.

KIDNEY WAX.—This new Wax Bean is claimed to be the most productive of all. It is also very early and the pods are extra large and very handsome, both in color, and form, tender and fine.



DWARF BEAN, BISMARCK WAX



DWARF BEAN, CYLINDER BLACK WAX

NEW BLACK EYE WAX.—The seed is white with black markings around the eye. It is the earliest wax bean in cultivation ; the pods are about an inch longer than the Golden Wax and plants are vigorous in growth. It is very productive, and the pods are large and beautiful in color.

WARDWELL'S NEW KIDNEY WAX.—This new variety is entirely free from *rust* ; it is earlier and will yield greater than either the popular Golden Wax or German Black Wax. A strong, vigorous grower. The pods are of a rich golden color, perfectly stringless, tender and of the finest quality.

THE YOSEMITE—Combines size, productiveness and quality in one variety, and is the nearest approach to perfection that nature has as yet given us in Wax Beans. The plant is a remarkably vigorous one, covering the ground with its heavy foliage in such a manner as to shade the earth and keep it moist ; and if the pods are kept closely picked, new ones will continue to be produced, and a marvellously large crop will be obtained.

RUNNER BEANS.

There are numerous varieties of Runner Beans, but those most generally grown are the common Scarlet Runner and Painted Lady. Carter's Champion has, during the last few years, been largely grown, and deservedly, for it is a fine productive Bean of good quality. There are many other kinds of Runner Beans that are by no means commonly grown, but which are yet of great special merit, and afford also differences in quality and flavour that make them specially acceptable. Allowing the Scarlet Runner, as it is, to be delicious, yet one may tire of eating it every day for weeks in succession, but if alternate dishes of other equally good kinds that differ in character can be furnished, the pleasure of partaking frequently of Runner Beans is enhanced.

The Scarlet Runner was introduced from South America in the year 1633, at a time when the question of the royal privilege in England was shaping itself into the form which eventually brought Charles I to the scaffold. It is supposed that the Scarlet variety, which grows so tall and is so prolific, was first cultivated about that time by Tradescant, the celebrated gardener at Lambeth. It was then, we are told, in so great repute for its flowers that they formed the leading ornament in the nosegays of the ladies ; and it seems to have kept its place only as an ornamental plant for nearly a hundred years, as its legumes were seldom used as an edible substance until brought into notice by Miller of Chelsea in the eighteenth century.

The latest novelties among Runner Beans are the Wax-podded and Yellow-podded, or Batter Beans, the latter name being given more out of compliment to the colour of the pod than to its edible quality. These are termed skinless, or rather, like the pods of the Sugar Pea, they have no lining, and should be cooked and eaten whole. To ensure good produce, a fair supply of nutriment when the plants are in full bearing should be the first consideration.

Runner Beans, when in full growth, make heavy demands upon the soil, and if not complied with, an attack of red spider and consequent deterioration in quality are the result. To ensure perfect success, some pains should be taken in the preparation of the soil ; and the most uniformly satisfactory system which I have ever employed is sowing in trenches that is to say, slightly below the level of the surrounding ground, a plan which ensures their being thoroughly watered in dry weather. The ground should be marked out with a line to length required ; the soil should then be taken out two spits in width and about the same in depth, cutting down one side quite straight and level, and throwing the soil out on the opposite side. This should be done some time before the Beans are planted, in order to allow the soil thrown out to become well sweetened. At sowing time, having previously placed good strong sticks close at hand, a layer of manure should be placed in the bottom of the trench ; then take the sticks and place their ends firmly upon the bottom, setting them upright against the even side of the trench ; then fill in with the soil already mentioned, mixing with it some manure as the work proceeds, and treading the sticks firmly in, in order to make all secure. In this manner the labour of cutting sticks will be saved, and they will have a firmer hold of the ground than they would have if merely inserted in the ordinary way—no small advantage, as in exposed situations they are liable to get displaced in rough windy weather.

If, as I have mentioned, the trench be not quite filled, and if, moreover, it be mulched with manure or litter of some kind, the labour of watering will be much reduced, the whole amount given going direct to the root. The evil regarding watering outdoor crops grown upon the level without mulching is that the water does not penetrate readily where it is most needed ; the surrounding soil being lower than that actually occupied by the roots, the water runs off without benefiting the plants. To many, this method of growing Runner Beans may appear to involve a greater amount of labour than necessary ; I write, however, for small cultivators—those principally who are obliged to make the most of a limited area, gardeners, of course, who grow Beans in large quantities are naturally obliged to get through their work in a somewhat quicker way, and could not well be troubled with sticking and other details of that kind. I am sure, however, that anyone who will make a trial of the plan just recorded, and will compare the results with those obtained in the ordinary way, will never begrudge the extra time and labour bestowed.

For Runner Beans, the rows should not be less than six feet apart when grown in a quarter exclusively devoted to them ; but it is much better to arrange them from twelve to sixteen feet apart and crop the intervening spaces with dwarf subjects.

Double rows are to be preferred to single ones, as they produce more Beans. Each seed should be at least 6 in. apart. Managed in this way they grow strongly, and if stopped when they have attained the height of 5 ft. or 6 ft. they will produce fine large trusses of bloom from top to bottom. Sowings should be made at the same time as recommended for the dwarf varieties. In the North-West Provinces and the Punjab not only the Scarlet Runner Class but most other species of Runner Beans thrive to perfection, they are not, however, recommended either for Lower Bengal or the Bombay Presidency, as although in these districts the plants grow with great vigour they can rarely be induced to set a single fruit.

In the Hills however they have found a congenial home, every variety that I have ever tried growing with the greatest freedom and bearing plentifully. Sowing may be made from March to May, The Scarlet Runner may here be grown as a perennial provided the old roots are protected from frost by a covering of litter or wood ashes, on the first approach of spring they will again start vigorously into growth, and if watered regularly will produce beans in abundance much earlier than crop raised from seed.

VARIETIES.

SCARLET RUNNER CLASS. - *Ph*

CARTER'S CHAMPION SCARLET.—Pods large and fleshy, a grand improvement on the old variety.

PAINTED LADY.—A variety of Scarlet Runner with very handsome flowers.

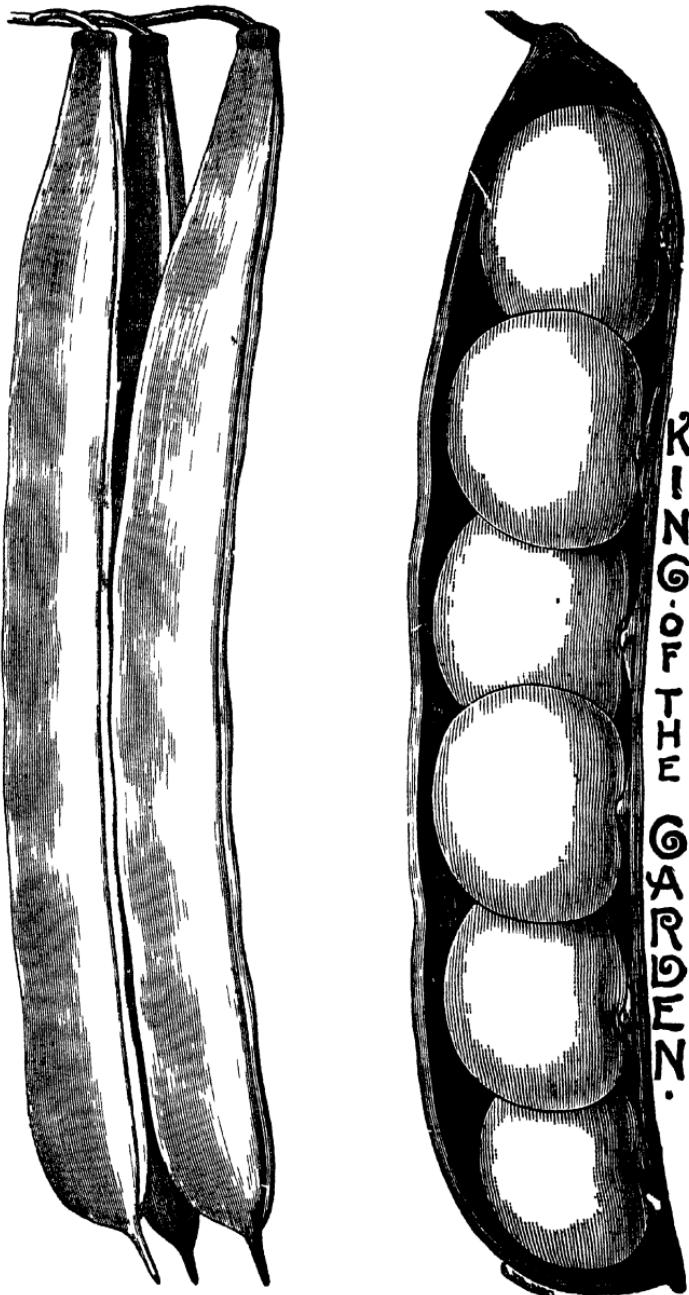
GIRTFOORD GIANT SCARLET.—Very vigorous grower and heavy cropper, pods very large, deep green colour, one of the best for Exhibition.

IMPROVED SCARLET.—A splendid selection from the old Scarlet, prolific.

NE PLUS ULTRA.—This is a highly improved variety of the old Scarlet Runner Bean, and undoubtedly the best of the many new forms of this highly prized old favorite. The pods are 12 to 15 inches in length, very thick and fleshy and of the most delicate flavour, immensely prolific.

THE SHAH.—A highly improved variety of the white seeded Runner Bean. Pods more than double the size of the original form, and of the finest flavour.

PERRY'S LEVIATHAN PRIZE—This Bean after several years' trial and careful selection, has proved to be the best variety for exhibition or table purposes. The pods are extra long, without being coarse or stringy, of excellent quality and flavour; they are produced in great abundance, and thereby are the best for market purposes. It is very hardy, and can be sown earlier or later than any other variety.



GOLDEN WAX FLACOURTI POLI BEAN LIMA BEAN, KING OF THE GARDEN.

WHITE DUTCH OR CASEKNIFE.—The earliest of all Runner Beans, very prolific and of good quality.

RUNNER FRENCH BEANS,—(*Phaseolus vulgaris.*)

These much resemble the Dwarf varieties in their produce, in the Punjab and other districts where we have a lengthened cool season, they are very valuable, as they not only bear most plentifully but continue in season very much longer than the dwarf kinds.

VARIETIES.

IMPROVED SOUTHERN CREASE-BACK, OR FAT HORSE. This variety has been the most popular Pole Bean in some sections of the South, especially Louisiana, for many years, and strange to say it has not been more largely disseminated. It is a strong grower and an abundant bearer, producing handsome green pods in clusters, which are from 6 to 7 inches long; it is entirely stringless and very fleshy.

SOUTHERN PROLIFIC.—The rapid growth of this bean produces pods brittle and tender. The pods in a green state are most excellent for cooking, and it is to-day one of the most popular varieties in the Southern States, where it is much better known than in the North.

BULGARIAN BUTTER.—A splendid new continental variety, with long fleshy green pods speckled with black, quite stringless.

Wax Pod Varieties.

BURPEE'S SUNSHINE.—The bright light-yellow pods are borne in clusters of three and four at every joint of the vines, and on a pole in full bearing the yellow of the pods greatly predominates over the green of the foliage—well warranting its name “Sunshine.” The pods are perfectly straight, and although flat when young, are meaty, of finest quality and *entirely stringless*.

GIANT WAX—Pods eight to nine inches long; clear, waxy yellow, thick and fleshy; very productive; when cooked tender and delicious.

MONT D'OR OR GOLDEN BUTTER.—This variety is of unsurpassed quality, produces pods of a beautiful golden wax colour, entirely stringless and very productive, they should be eaten when young. This variety cannot be recommended too highly.

BEAN—EARLY GOLDEN CLUSTER WAX POLE—This is the earliest of all varieties of Pole Beans, surpassing the famous Giant Wax, in both quality and productiveness, the pods are of a beautiful, golden yellow color from 6 to 8 inches in length, entirely stringless, and are produced in large clusters; one of the desirable features is that of retaining tenderness and fullness after the beans are developed, of delicious flavor and cannot be too highly recommended.

BEAN—NEW GOLDEN WAX FLAGEOLET POLE.—This new variety is regarded by many as the cream of all Wax Pole Beans; it was introduced from Germany two years since, and has already become a great favorite for its many good qualities. Its pods are of a beautiful, golden yellow color, entirely stringless, of round form, full and fleshy, and of exquisite flavor; the vines commence bearing when quite young and continue throughout the season, producing a succession of young and tender pods, ranging in size, from 7 to 8 inches in length, and produced in large clusters.

LIMA BEANS,—(*Phaseolus lunatus*).

The Lima Bean although a native of this country, appears to be but very little known. The plant is a very rampant climber and require stakes at least ten to twelve feet high for its support. The pods are borne in clusters of three or four at almost every joint, these are not edible, but the broad flat beans are shelled similar to Broad Beans and when cooked have a flavor much resembling roast chestnuts: culture the same as the other varieties of Runner Bean. In the Hills where they grow and fruit most luxuriously, they should not be sown before the middle of April.

VARIETIES.

KING OF THE GARDEN LIMA.—While the dried beans are about the same size as the common Large Lima the green beans are of unusual size. The pods are very long, and frequently contain four to six very large beans. Specimens have been selected *five on a stem*, and each pod containing five beans. The beans are large and handsome, while in quality they are excellent. The pods are produced in large clusters, and the luxuriant vines present a beautiful sight, so thickly laden.

EXTRA EARLY LIMA (Jersey).—The beans are nearly as large and fully as good as the Large Limas, while they mature nearly as early as the Small Lima. The vines are vigorous in growth, bearing profusely, large, broad pods in clusters of four.

CHALLENGER—DREER'S IMPROVED OR POTATO LIMA.—Early and very productive: if measured in the green state the pods are smaller than in the large white Lima, but the beans are very plump, and are so close together in the pods as to crowd against each other.

LARGE WHITE LIMA.—The well known favorite. Large, greenish white beans, of finest flavor shelled green, and also good dried for winter use. Being very tender, it should not be planted before the ground is warm. The beans will come up sooner if the eye in the seed is placed downwards.

CAROLINA, OR SEWEE.—This variety is similar to the Lima, growing fully as strong, but half the size; as a market variety it is not so desirable, but I consider it more productive; there is no difference in flavour.

NEW DWARF, OR BUSH LIMA BEAN.—This is undoubtedly the most valuable vegetable novelty that has been introduced for many years. Thousands have been deterred from cultivating the most delicious of vegetables—the Lima Bean—from the great trouble and expense of procuring

the unsightly poles on which to grow them. This is now a thing of the past, as the New Bush Lima, grows without the aid of stakes or poles, in compact bush form, from 15 to 18 inches high, and produces enormous crops of delicious Lima Beans, which can be as easily gathered as the common garden bush beans, it is at least TWO WEEKS EARLIER than any of the climbing Limas. This fact alone would stamp it as the most valued novelty of recent years, but when in addition to this we realize that it is a true bush bean, requiring no supports, some idea of its great value can be realized, it produces a continuous crop from the time it comes into bearing and being enormously productive, a very small patch will keep a family supplied with this splendid vegetable throughout the season. The beans are of the size of the Sieva or Southchin Lima.



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BEET — (*Beta vulgaris*)

VERN — CHUKANDAR, MOL PALANG

This is one of the most valuable vegetables, and is probably more popular in this country even than in Europe.

A deep sandy loam, trenched to a depth of at least 30 inches, suits it better than any other kind of soil, and if poor, it should have been well manured for the previous vegetable crop or at least six months before it is required for Beet. In such soils,

the cleanest and most even roots are produced, but Beet will also succeed on calcareous soils, if of sufficient depth. Heavy or stiff loams intended for its growth should be thrown up into ridges before the rains set in, so as to get well pulverised, and, if very heavy, a light dressing of coal ashes worked into them would prove advantageous, and materially assist in producing clean roots; stable manure should not be added to the soil unless it is trenched deeply, when it may be placed quite at the bottom of the trench; if otherwise, as soon as the roots reach it they become forked, instead of making straight, well-shaped roots; therefore, if the soil be so poor as to require manure, I would recommend a sprinkling of guano, or superphosphate, to be applied to it between the rows as soon as the plants are fairly established.

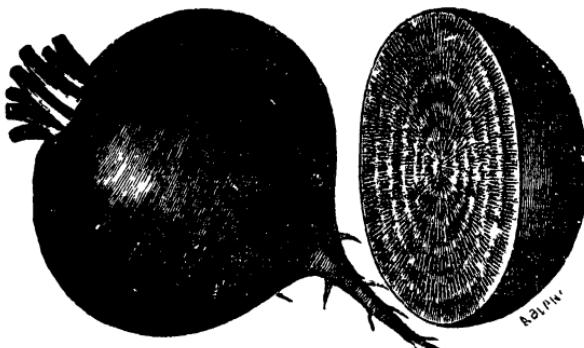
Beet must have an open situation; it never grows or looks satisfactorily when grown under the shade of fruit trees, a position to which it is often relegated, and why this should be the case, I am at a loss to imagine, most varieties of Beet are ornamental as well as useful, and one would, therefore, suppose that a conspicuous place would be selected for them.

For an early crop, a small quantity of seed should be sown in pans about the middle of August, and if they come up too thickly, should be transplanted into other pans, where they must be kept till the end of the rainy season, when they should be planted in trenches as mentioned above. These, however, never make such fine roots as those sown in the open ground about the end of September.

The seed should then be sown in drills 15 in. asunder, and 1 in. deep; and it should be covered in by hand—a rake should not be employed for this purpose, as by its use half the seed is often drawn out of the drills, and the crop turns out a failure. Thin out the seedlings, as soon as they are large enough to handle, to 9 in. apart in the row, and if dark, bronzy-leaved kinds be grown, see that the greenest-looking plants are drawn out. After thinning has been completed, by means of the hoe frequently loosen the soil between the rows, an operation which will aid the growth of the Beet, and at the same time keep down weeds. If blanks, through failures, occur in the rows, they should be filled up with young plants in showery weather, though roots obtained in this way rarely prove satisfactory, being small and irregular in growth; still it is worth doing, if only for the sake of a good appearance.

Sowings in the Hills may be made at intervals from February to September. When lifted, the tops should not be cut, but screwed off, and the roots should not be injured more than can be

helped, as such injury induces decay. Before cooking, the roots should be well washed, but not peeled or scraped, or in any way bruised, for, if such be the case, much of the saccharine matter escapes during the boiling, a process to which preference is generally given, and this mode of cooking doubtless renders Beet most agreeable to the generality of palates ; though some prefer to bake it, by which mode a deeper colour of flesh is ensured, and a firmer texture, and where these are desired, or the roots much bruised, baking should be the plan adopted.



BASTIAN'S BLOOD TURNIP BEET

VARIETIES.

As a rule, the colour of the roots is the first consideration ; but that, I think, is a mistake, as flavour should have precedence, rather than colour. Where both are combined, however, as is the case in Dell's Crimson, which has many synonyms, such a variety must be the best to grow; moreover, this variety has the additional attraction of deep crimson-coloured foliage, and is of no small importance as an ornamental plant. Other good varieties are—

HENDERSON'S PINE-APPLE, NUTTING'S DWARF RED AND EGYPTIAN TURNIP-ROOTED.—The last being more especially suited for growth on shallow soils.

BASTIAN'S RED TURNIP.—An early variety, medium size and good colour, recommended.

BLOOD RED TURNIP.—Flesh deep blood red very sweet and delicate in flavour.

BASSANO.—Very early, flesh not so good in colour as the preceding varieties.

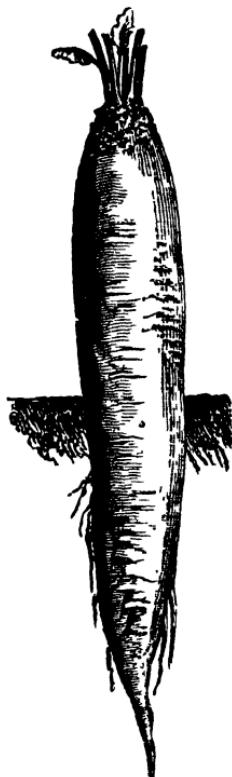
CROWN PRINCE.—Root deep blood red, foliage very dark.

CATTELL'S DWARF BLOOD RED.—Fine rich colour.

COVENT GARDEN RED.—Roots dark red colour and well shaped, good flavour.

DELL'S CRIMSON.—Useful alike for culinary purposes and flower garden decoration, the foliage being of a rich crimson colour and remarkably effective.

DRACÆNA LEAF.—This is one of the most distinct varieties yet introduced, the foliage being entirely different from any other kind in cultivation, the leaves being about half to three quarters of an inch in width and about 15 inches in length, the roots are of medium size and colour and fine flavour. As an ornamental plant, for Flower Garden decoration this has few equals.



LONG BLOOD RED.

American Varieties.

ARLINGTON BEET.

I can recommend this variety for both the amateur and the market gardener. It is somewhat of the same style as Dewing's Blood Turnip, but quite distinct, being rather flat and much earlier, it is similar to the Eclipse in shape, but is darker and more desirable in color. The peculiar and distinctive feature of the Arlington Beet is the fact that it does not become bitter and stringy when it is a little old, as is the case with many other varieties.

EGYPTIAN DARK RED TURNIP-ROOTED—Flesh dark crimson, of good flavour. The earliest variety.

FRISBY'S EXCELSIOR—A very fine new variety, medium size, good colour and excellent flavour, a very ornamental kind.

LONG BLOOD RED—Root smooth and almost black, 12 to 14 inches long.

MIDDLETON PARK FAVOURITE—Fine dark colour, and excellent quality; useful for both culinary and decorative purposes.

NE PLUS ULTRA;—Brilliant crimson red foliage, with demi-long roots of very superior flavour.

NEW PEAR SHAPED—A very fine variety, roots and foliage very deep blood red.

NUTTING'S DWARF RED—Medium size, fine dark colour and excellent flavour.

OMEGA—A new dwarf topped variety, deep red colour, delicate sweet flavour.

OSBORNE'S DWARF RED—Flesh deep blood red, medium size, roots long and tapering very fine.

VEITCH'S IMPROVED BLACK—A fine variety of very dark colour and good flavour, grows to a large size, and is valuable for early use, or may be sown late for general crop.

VICTORIA—Deep blood-red, one of the best.

WHYTE'S BLACK—A very dark crimson variety, of fairly good quality.

REINE DES NOIRES (QUEEN OF THE BLACKS)—A unique and beautiful variety, desirable both for its table qualities and ornamental foliage. The habit of this variety is very erect and its handsome foliage is a dark blood red, resembling in color a dark variety of Dracena or Canna. The beet itself is full sized, dark crimson in color and unexcelled in quality.





EGYPTIAN RED TURNIP



16

DELL'S CRIMSON



BEET, DRACENA LEAF.



COVENT GARDEN RED.

BUIST'S EXTRA EARLY—This variety is a cross between the Extra Early and the Red Turnip; it is fully as early as the former but the flesh is of a brighter color, approaching the Early Red Turnip, and for market gardening it is unsurpassed. This is almost identical with Burpee's Extra Early.

DEWING'S IMPROVED BLOOD TURNIP—Fine turnip form, very symmetrical in shape, and free from any fibrous roots. Flesh deep blood-red, very tender, and sweet, grows uniformly to a good size.

BUIST'S SCARLET PERFECTION—One of the most beautiful varieties grown, of half-long shape, dark-blood color, with a deep, rich crimson foliage; a very desirable and elegant variety, and has become very popular.

EDMUND'S EARLY TURNIP—This splendid new variety from Massachusetts is the most uniformly "thoroughbred" of all beets; with very small tops, the neat, short foliage being a rich bronzy red.

BEET, NEW CRIMSON BALL—This is a very great acquisition, to the varieties of Turnip Beet, for its fine flavor, extreme earliness, and beautiful crimson color. It is a very desirable variety.

ECLIPSE—The Eclipse is remarkable, not only for its wonderfully rapid growth, but also for the smallness of top and extra fine quality. It is fully as early as the Egyptian, and of better quality.

Borecole. See Kale.

BROCCOLI, (*Brassica oleracea botrytis asparagooides*)

VERN.—CHOTA PHOO. KOBEE.

THE Broccoli, which is really only a hardy class of Cauliflower, is very extensively cultivated in Europe. This is, of course, owing to the fact that it is hardier and better able to withstand a low temperature than the latter.

Broccoli thrives best in a deep loamy soil, well drained, but it is not very particular in this respect, and will produce fine heads in any well-enriched soil of which the staple is loam. In old garden soils in which humus has accumulated, it is often attacked with the grub or maggot, which causes "clubbing." In such cases lime may be applied with great advantage, or burnt clay and fresh loam, if it can be afforded. The ground should be trenched two or three spades deep previous to planting, and the manure, if rotted, well incorporated with the soil, or if rank, buried in the bottom of the trench. If trenching cannot be done, then Broccoli should follow some other crop, such as Potatoes or Onions, or any crop not belonging to the Cruciferæ or tap-rooted section, such as Carrots, Turnips, or Beet, and the ground should be dug as deeply as a good spade will go, and well manured. Where the soil in which Broccoli is to be planted is naturally of a light character, if moderately rich, it should not be dug, but made as firm as possible round the plants. The best kind of manure for Broccoli is undoubtedly well-rotted stable manure, with a sprinkling of soot added to destroy worms.

Seed may be sown in the Punjab and North-West Provinces, from about the middle of August and in Bengal early in September, as soon as the plants have made their first pair of perfect leaves they should be transplanted into a bed of good rich soil at a distance of four inches apart each way ; in ten to fifteen days they should be again transplanted, this time keeping the plants fully six inches apart, fifteen days later give them still another shift, placing them fully nine inches apart, about three weeks after this last transplanting they should be ready to be put out into their permanent quarters.

If the weather be dry, the seed-bed, or that from which the plants are taken, should be watered well the night before to soften the soil. The holes to receive the plants should always be made sufficiently large to admit of their being easily put in without breaking their roots "Buttoned" and stunted plants are in many cases caused by bad planting. They are put in with broken and mutilated roots ; and those that have a tap-root often have it bent double in getting it into the hole, and, instead of the point being at the bottom of the hole, it will be sticking up above the surface.

The best time for sowing in the Hills is during August and September, planting out should be done early in October so that the plants may get a good hold of the soil before the cessation of the rains they will require to be well watered during dry weather.



BROCCOLI, WHITE DWARF MAMMOTH.

VARIETIES.

There are an immense number of varieties now grown in England, many of these, however, are quite unsuited to our climate, as they take a very long time to attain maturity, the following varieties are all of quick, vigorous growth and can be recommended with confidence.

CARTER'S CHAMPION—A large variety, of good flavour.

CHAPPEL'S CREAM—One of the best, heads large and fine.

COVENT GARDEN WHITE—A splendid variety with firm heads.

DILCOCK'S BRIDE—A very large and compact variety, splendid flavour.

FRENCH WHITE—An early variety, strongly recommended.

LEAMINGTON—One of the best varieties, heads 8 to 9 inches in diameter and very solid.

MALTA EARLY WHITE—A fine early variety, good size head of fine colour.

PERKIN'S MAMMOTH—A very large variety, if sown early will produce splendid heads.

NUTTON'S PERFECTION—A dwarf, handsome variety, very compact in habit and of fine quality.

VEITCH'S SELF PROTECTING—A very fine kind, much resembling Cauliflower Autumn Giant but coming into season a month later, if sown at the same time as that variety.

WHITE DWARF MAMMOTH—A splendid variety, producing heads in every respect equal to the best varieties of Cauliflower.

BRUSSELS SPROUTS (*Brassica oleracea bullata minor.*)

VERN.—GOONEEGOON KOBEE, CHOKE KOBEE.

A well-known variety of the Cabbage family, which, instead of forming a single head, produces numerous sprouts, each about the size of a hen's egg, one from the axil of each leaf. When well grown this is one of the most delicate flavoured vegetables we possess. To ensure really good sprouts, it is necessary that they should be grown without a check from the time of sowing, up to the period when they have made their full growth. Many experienced English cultivators recommend that the seed should be sown in the places where the plants are to remain. This, although possible in England, could never be attempted in the plains in consequence of the rainy season being at its height at the time that it is necessary that the seed should be sown. The best plan to adopt, therefore, is to raise the plants in small pots in the manner recommended for early Cauliflowers, or the seed may be sown very thinly in a seed-bed under shelter; and as soon as the plants are large enough, they should be transplanted with a large ball of earth adhering to them, so that the roots are not injured.

Brussels Sprouts will succeed in almost any kind of soil, provided it be well and deeply cultivated, and fairly manured. Poor sandy soil will require a heavy dressing of good manure, whilst lime and burnt clay may be beneficially applied to cold clayey land, just previous to planting, in preference to rank manure, which would

have a tendency to produce gross open Sprouts instead of the close, medium-sized buttons that are so much appreciated. Frequent stirrings of the soil, general clean culture, and removing decaying leaves, add to their growth and cleanly appearance, and ought to receive attention. As regards earthing up the stems, there has been much dispute as to the merits and demerits of the practice, but I have seen them grown both with and without that assistance, with much about the same result. In exposed places, however, earthing up is certainly to be recommended, in order to enable them to resist the force of the wind; but, as Brussels Sprouts, unlike Cabbage or Broccoli, bear all up the stems, it is not desirable to bury them to any great depth beyond giving them necessary support. The Cabbage-like heart should not be cut off from the centre of the plant until the crop is fit for gathering.

Good soakings of manure water, given to Brussels Sprouts during dry weather, will help to keep them in a vigorous and healthy growing state. In gathering, Brussels Sprouts are frequently broken from the stems of the plants, and sometimes with a portion of the stem adhering to them; but this is a mistake, inasmuch as it destroys the second crop of young Sprouts. A sharp knife should always be employed to cut off the Sprouts, leaving as much spur as possible without impairing the size of the Sprout. The largest and hardest should always be gathered first, in case they should burst, and consequently become spoiled.

Seed should be sown at the same time as the earliest varieties of Cabbage. In the Hills sow at any time from April to September.



PARIS MARKET.

BRUSSLL SPROUTS--SCRYM-
GEOUR'S GIANT.

VARIETIES.

AIGBURTH.—A superior variety of robust habit, producing a large crop of fine solid sprouts of splendid flavour.

COVENT GARDEN.—A very fine strain, producing sprouts of large size and good quality.

CUTBUSH'S GIANT. Without exception, the finest possible strain of this excellent vegetable. From repeated trials with other varieties in various parts of the country, it has proved itself to be unsurpassed.

CRAIG'S FAVORITE.—A very fine new variety, strongly recommended.

DALKEITH.—A superior variety with fine large sprouts.

PARIS MARKET.—A very fine dwarf variety that cannot be too highly recommended, the plants rarely exceed a height of two feet and are densely clothed with small, very solid sprouts of the most delicious flavour.

PRESIDENT CARNOT.—This variety is described by the raiser as “the finest in cultivation,” the Sprouts are very large and of fine quality. The stems are of medium height, densely covered with sprouts forming symmetrical pyramids.

SUTTON'S READING EXHIBITION.—The largest variety, strongly recommended to intending exhibitors.

VEITCH'S EXHIBITION.—As an Exhibition variety, this cannot be too highly recommended, it is of medium height, sprouts large and regular in size, and of very fine flavour.

SCRYMEOUR'S GIANT.—A first class dwarf growing variety.

SUTTON'S MATCHLESS.—Excellent and productive, of robust and vigorous growth. The stems are covered with compact globular Sprouts of good flavour.

THE CABBAGE, (*Brassica Oleracea Capitata*).

VERN.—KOBEL, BANDA KOBEE.

Probably, with the exception of the Pea, no vegetable can boast of so many named varieties as the Cabbage. It cannot, however, be said that these are all distinct kinds, on the contrary, very many of the supposed new varieties that are being continually introduced are nothing more or less than synonyms of old well known sorts that have been in cultivation for years, although some of them, by careful selection, may be considered as decided improvements on those which they have descended from, and which they so closely resemble. As evidence of this, I may mention that some two or three years since the Royal Horticultural Society of England undertook an exhaustive series of experiments with the Cabbage, in which upwards of one hundred varieties were grown for trial, the result of which was that it was proved beyond dispute that there were really only sixteen or eighteen distinct kinds, the remainder of those tried being either identical with the types selected, or mere cultural improvements on them.

Even in very small gardens, it is always advisable to grow two or three varieties, as by this means Cabbages may be had in season from December to June when a proper selection is made. For a very early crop, such varieties as Early York, Express, Early

Etampes, Ellam's Early Dwarf, and Early Paris Market may be relied upon, these should be followed by Daniel's Defiance, Carter's Heartwell Marrow, Enfield Market, Imperial, Early Jersey Wakefield, Mein's No. 1, Rainham and King of Cabbages, all of these varieties belong to the Conical or Pointed Head class, these may be succeeded by the Early Drumhead varieties such as Henderson's Early Summer, Burpee's Surehead, New Peerless, All Seasons and Improved Brunswick. The latest crop should be selected from such varieties as Succession, Autumn King, Marblehead Mammoth, Improved Drumhead, Improved Flat Dutch, Florida Header, Burpee's All Head and Short Stem Drumhead.

Culture.—The Cabbage is a very gross feeder, and to grow it successfully it must have liberal treatment, and more especially so in this country where its growing season is much more limited than in a colder climate. The first sowings may be made towards the end of August, in seed-pans placed in a sheltered position, but allowed as much light as possible as soon as they germinate, otherwise the plants will probably become drawn and damp off. As soon as they become at all crowded, they should be thinned out and either transplanted into other *gumlahs* or into the open ground in a raised nursery bed, under the shelter of a *hoogla* or mat. It is certainly a doubtful question if much advantage is gained by making early sowings in seed-pans as described above, although it is a practice very generally adopted. One objection to it is the extra trouble necessary to raise good strong plants, and another that plants grown in this way never thrive so freely, or produce such a good crop as those raised in the open ground and transplanted to the place where they are to remain direct from the seed-bed. The ground in which the plants are to be grown can hardly be made too rich; the manure best suited for the Cabbage is night-soil, but in this country it is of course entirely out of the question to employ it on account of the prejudices of the *make*. The next best is goat or sheep manure, and where procurable, should be used in preference to any other. Many cultivators recommend the old Chinese method of planting, that is to make regular rows of holes, each eight inches in diameter and of the same depth, at a distance of 18 to 24 inches apart. These holes should be filled up with a rich compost made of equal parts of mould and manure. This is certainly an economical method, but should never be employed when plenty of manure is available. A much better plan is to make trenches, twelve inches wide, removing the soil to a depth of nine inches, then have the bottom of it well turned up to the depth of ten or twelve inches. After this, four or six inches of manure should be added, which must be well forked into the soil, the plants should then be placed in the centre of the trench at a distance of 15 inches apart for the smaller varieties, and two feet apart for the larger sorts, and the same space should divide the rows. The

young plants will require to be shaded for three or four days, and should be liberally supplied with water till well established.

Keep the hoe constantly stirring round the roots of the plants, nothing promotes vigorous growth so much as to admit plenty of air into the soil. When the plants are about half grown, a good plan is to open out their roots to a depth of two or three inches and leave them exposed to the sun for one or two days, then fill up with old sheep manure, good loam and mustard or Cotton Cake in equal quantities, the ground should then be well irrigated, this may be repeated in 15 or 20 days ; those who have never tried this treatment will be surprised at the wonderful result obtained when it is intelligently applied. It 1886, when the Marblehead Mammoth Cabbage was first introduced into this country, I grew a crop of about 400 plants under this system that averaged over 30 lbs. each, three selected heads turning the scale at 43, 45 and 49 lbs. respectively.

In the Hills it is generally recommended to sow Cabbages from March to September, spring sowings, however, cannot be relied upon to produce a good crop except in places where there is an ample water-supply, the better plan is to sow some very early variety about the end of June, these if pushed forward, will produce nice heads from October to December, and about the middle of September, sow for general crop any early variety such as Daniel's Defiance, Jersey Wakefield or Early Summer and to succeed these Brunswick, Flat Dutch or Florida Header, the plants for these sowings will be ready to put out by the end of November and if properly cared for, will continue in season from March to July or even August.

VARIETIES—The number of varieties or rather supposed varieties, is almost legion, I have endeavoured in the following list to include only such kinds as can be relied upon with confidence, and at the same time have some distinguishing characteristic of their own.

SECTION I.—ENGLISH AND CONTINENTAL VARIETIES.

CONICAL OR POINTED HEADED.

FILDERKRAFT.—The pointed, conical heads attain a large size, can be

used medium early, but are specially valuable for late use. The heads are very hard and solid : they feel nearly as hard as marble, are of excellent quality, pointed or conical in shape, with a peculiar twist at the top. It is remarkable for its certainty to head ; it is very hardy and thrives well every where.

KING OF THE CABBAGES.—A valuable kind for general crop ; early, and of superior quality.



CABBAGE, EXPRESS.



CABBAGE CATTELL HEARTWELL
conical in form very solid and compact of a yellowish green a very
desirable variety

CATTELL'S EARLY HEART
WEIT One of the best
early varieties The heads
are extremely firm with few
outside or loose leaves very
mild flavour

CATTELL'S RELIANCE —
One of the earliest, first
class quality

COCOA NUT — Small and
distinct excellent quality

DANIEL'S RELIANCE
GIANT EARLY MARLOW
A magnificent variety growing
in the weight from ten
to twenty pounds. Remarkably
early short legged and
compact and of the most
delicious narrow flavour

EXCELSIOR This is un-
doubtedly the earliest Cab-
bage in cultivation. The
heads are of medium size,

ELLAM'S EARLY
DWARF — A first class
early Cabbage in all respects
Being very compact, they can be planted
very close together, thus
growing double the
quantity of plants on the
same space usually occu-
pied most other kinds

EARLY ITALIANIS
Excepting only the new
"Express," described
above, this is the earliest
variety in cultivation
the heads are oblong,
very solid and firm
medium size, and of very
fine quality



CABBAGE DANIEL RELIANCE

LITTLE PIXIE OR TOM THUMB small, delicate flavour.

MEIN'S NO. 1.—The largest and best early Cabbage ever sent out. The hearts are formed very early, and ultimately attain to a great size and weight, of finest quality, and keeping very long without bolting to seed.

NONPARLIL IMPROV'D.—One of the best and earliest, small compact heads, delicate flavour.

PARIS MARKET—early variety, somewhat resembling the Oxheart in form but is far superior to it.

SHARP'S ENFIELD MARKET—A great improvement on the ordinary variety producing fine solid heads of splendid quality.

SUTTON'S IMPERIAL—This popular Cabbage maintains its reputation as the best and most profitable variety that can be grown. The heads are conical in shape, large, firm, very tender, and of superior flavour.

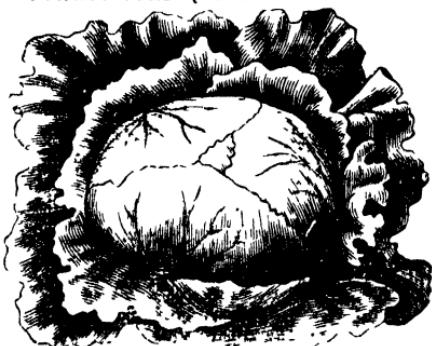
SUTTON'S ALL HEART.—A splendid new variety, heads medium size and very solid, produces but very few outer leaves, it can therefore be planted close.

CABBAGE, PARIS MARKET.



CABBAGE, FELDKRAUT.

SCHWEINFURT QUINTAL.—The earliest



CABBAGE BRUNSWICK.

plenty of flavour in a Cabbage will appreciate this variety.

WINNIGSTADT.—A medium-sized, second early variety with large, light green, fleshy leaves, and forming broad conical, solid hearts, of excellent quality.

WHEELER'S IMPERIAL.—very early, and an excellent sort for general use.

DRUMHEAD VARIETIES.

BRUNSWICK.—A very large flat variety of excellent quality and early.

MAGDEBERG.—A good large variety, highly recommended.

of all large Drumheads; grows from a foot to eighteen inches in diameter; does not head very hard, but is remarkably tender. The heads are very handsome, and almost as rich in flavour as the Savoy class.

TORONTO GIANT.—This variety is described as an improvement on the preceding and coming into season about a month later.

ULM QUINTAL.—Closely resembling the Schweinfurt, but does not attain such a large size.

HURST'S SELECT DRUMHEAD.—Very large, hardy and productive, never fails to head, those who like

RED OR PICKLING CABBAGE.

BLOOD-RED BERLIN.—Medium sized and excellent quality.
ERFURT BLOOD RED.—Very dark, the best for pickling.

LARGE RED DUTCH.—This variety is the largest in cultivation, forming immense solid heads but not so dark in colour as the preceding.

EARLY POINTED HEAD.—In shape this resembles the early York, heads of medium size very solid and splendid colour.

SECTION II—AMERICAN VARIETIES

During the past few years wonderful improvements have been made by our American cousins in this family, especially in the Drumhead class, both in point of size and quality, some of these being now almost as delicate in flavour as the best varieties belonging to the Conical Section. American Cabbage seed is yearly increasing in popularity in this country no doubt owing to the fact that as a rule it possesses better germinating power and a greater certainty of heading than many of the European varieties sometimes cultivated.

ALL SEASONS.—Where only one variety is grown, this is superior to all others, the heads are of good size, very solid, and form early, remaining a long time in season.

EARLY JERSEY WAKEFIELD—Unquestionably the best early Cabbage in cultivation. It possesses the merit of large size of head, small outside foliage, and uniformity in producing a crop. About 12,000 can be planted on an acre.

FLORIDA HEADER.—One of the finest of the new Drumhead varieties, heads large and very solid, frequently weighs upwards of 20 lbs. should be sown early as it takes a long time to mature.

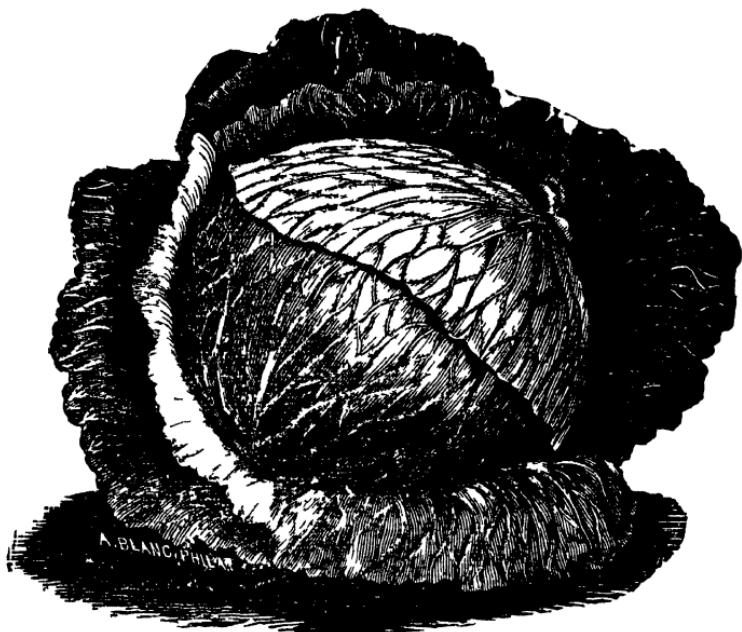
HENDERSON'S EARLY SUMMER.—Heads about ten days later than the Jersey Wakefield, but being of over double the size, it may be classed as the best *large early* Cabbage. In weight it is equal to most of the late varieties, and its short outer leaves enable it to be planted as close as the Jersey Wakefield, about 12,000 to the acre, while the Early Flat Dutch, Winningstadt, etc., producing no larger heads, can only be grown at the rate of 8,000 to the acre.

HENDERSON'S SUCCESSION.—A splendid new variety in form resembling Henderson's Early Summer but growing to nearly double the size and coming into use about 15 days later. As a main crop variety this has few equals, certainly no superior.

MARBLEHEAD MAMMOTH DRUMHEAD.—Probably the largest variety of Cabbage in cultivation, specimens often weighing 60 lbs. In good soil and with proper culture it will average 30 lbs. Heads round, somewhat irregular in shape. Should be planted four feet apart each way.

PEERLESS EARLY.—This cabbage is selected from a cross made by a Massachusetts Market Gardener, who claims it to be superior to Henderson's Early Summer, and says of it: "Nearly equaling Jersey Wakefield in earliness, and forming very much larger heads (often weighing more than twelve pounds apiece). Very round and uniform in shape, and general appearance, fine grained, small, short stump, with few loose leaves, thus allowing them to be set out nearer together; it also has the very valuable quality of remaining after fully matured without cracking or bursting, much longer than any other."

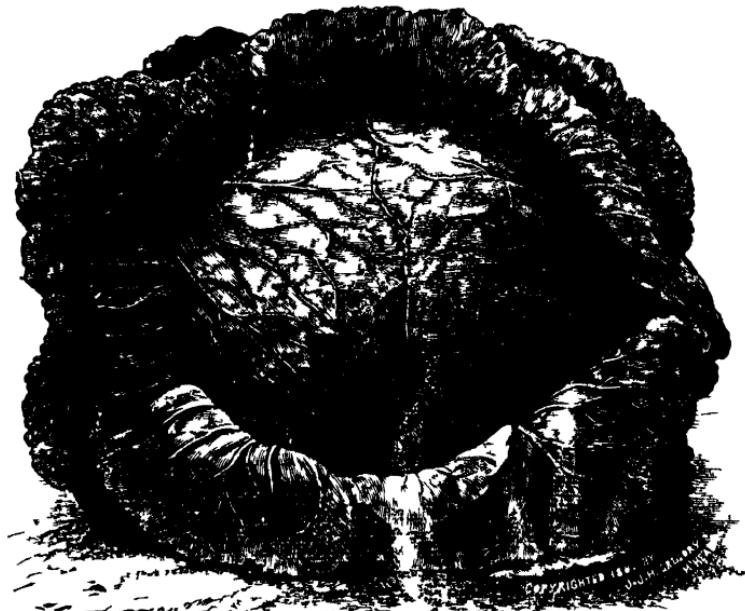
PREMIUM LARGE LATE DRUMHEAD.—Similar in every respect to the Flat Dutch in its growth and general habit, but producing heads which have a more rounded top.



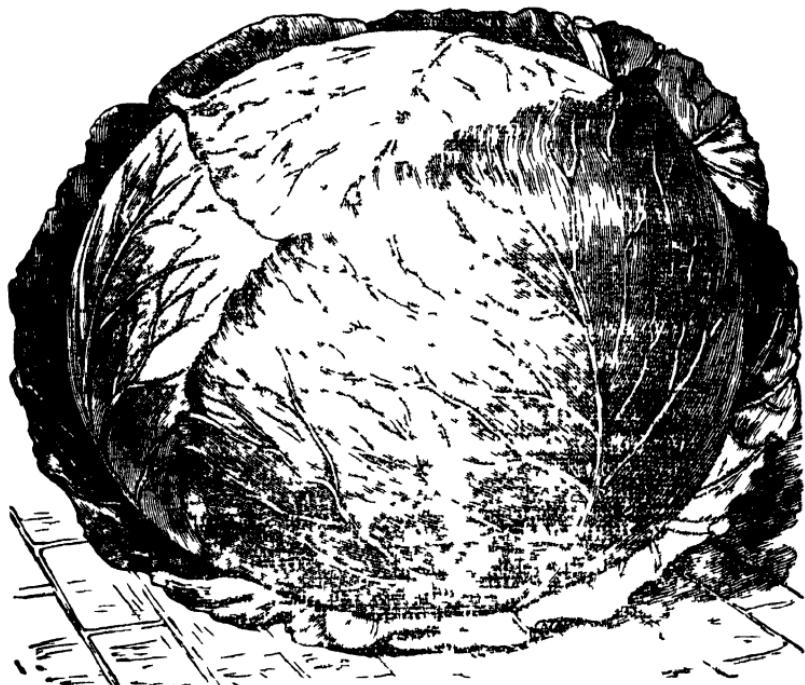
CABBAGE, MARILEHEAD MAMMOTH



CABBAGE, EARLY SUMMER



CABBAGE ALL SEASONS



CABBAGE, FLORIDA HEAD

PREMIUM LARGE LATE DUTCH.—One of the oldest varieties in existence, and more largely planted than any other sort, producing large, solid heads of bluish-green with a broad-flat surface. The head is white, crisp and tender.

The two last named are the standard varieties with American Gardeners, of these many improved forms are offered, under various names such as Buist's Improved, Burpee's Selected, Faust's Prize, &c., &c., all of them more or less resembling each other.

SAVOY CABBAGE (*Brassica oleracea bullata major.*)

VERN.—KAFFREE KOBEB.

This, like all of its class, delights in deep, rich, well manured soil. It should be cultivated in the same manner as recommended for the Cabbage. The dwarf varieties, such as "Little Pixie" and "Tom Thumb," are decidedly the best. These should be planted out in rows about fifteen inches apart with the same distance dividing the plants in each row. They should be liberally supplied with water through the whole period of their growth.

AUBERVILLIER.—An improvement on the old reliable *Virtus* or *Drum-head Savoy*, with a shorter stem and outer leaves the colour is also of a lighter green. It has all the good qualities for which the old sort has become so famous. It may be said to be now the best *Savoy* as it combines heavy weight, large size and good quality.

DRUMHEAD.—The largest growing variety, hardy and excellent.

DWARF GREEN CURLED—This is the best variety for general use. It is very finely curled, and the leaves are a beautiful green colour.

EARLY DWARF ULM.—A very superior and distinct dwarf growing early variety of quick growth.

ERFURT SUGAR LOAF—A fine new conical shaped variety of good size, very quick growing, and surpassing in flavour all other known varieties.

GROOT'S FAVORITE.—A medium size variety that can be strongly recommended, the heads are very firm, beautifully curled and of very delicate flavour.

GREEN GLOBE—Heads medium size, very solid and of the most delicious flavour.

GOLDEN GLOBE—A very fine variety, heads of a bright golden yellow.

LONDON MARKET—Heads large and very solid, leaves densely curled, strongly recommended.

MILAN DRUMHEAD—One of the largest, heads solid and compact, but less curled than other varieties.

NEWTON SAVOY—This is the finest of the Savoy class, and a general favorite. Heads large, very solid and compact, of a yellowish green color, and, like all others of the Savoy varieties, is of excellent flavor, far surpassing that of any other late Cabbage.

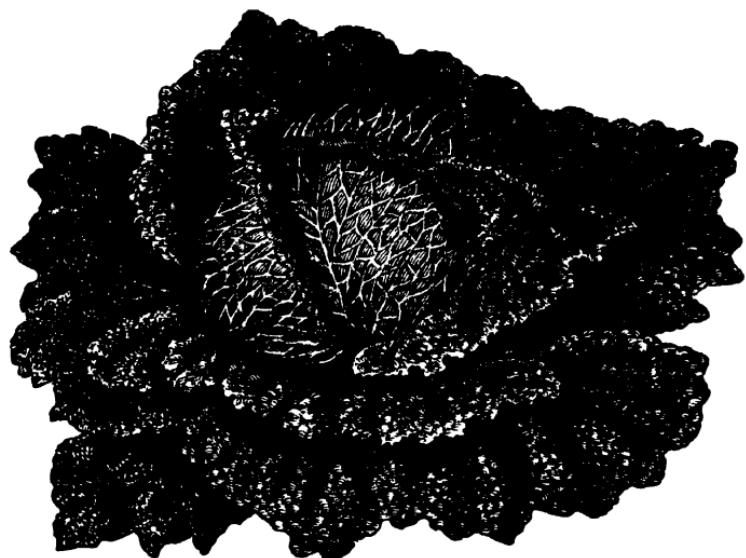
PERFECTION DRUMHEAD SAVOY—Heads large and very finely curled; short stalk and compact grower; an excellent keeper. Partakes of the size of the Drumhead, with the curled leaves and the fine flavour of the Savoy. Far superior to the ordinary Drumhead Savoy.

TOM THUMB—A small early variety of very delicate flavour.

VIRTUS—The largest variety, of superior quality.

VICTORIA—Extra fine curled, with finely crumpled foliage; an excellent variety.

VIENNA—The earliest variety, small compact hearts.



NETTED SAVOY



SAVOY, LARGE AUBERVILLIERS.

CAPSICUM OR CHILI—(*Capsicum annum.*)

VERN.—MIRICH, MIRCHA, LUNKA OR KAPSIKAM.

The ordinary varieties of the Capsicum are so well known and so extensively cultivated in this country that they hardly need be mentioned here; for, no matter how small a garden may be, and possibly without another vegetable in it, wherever a native *mâlee* is employed, two plants are certain to be found there—these are the common Chili, and Toolsee (*Ocimum sanctum*), a plant held in great reverence by the Hindoos.

There are, however, several new varieties introduced during the past few years which are deserving of a place in every garden—not only for the value of their produce, but also for the extremely ornamental character of the plant.

The seeds may be sown at any time from March to October in the plains in pots or pans well drained and filled with sandy loam and leaf mould in equal parts, and if kept well shaded will germinate more quickly and the plants will be much stronger than if they were fully exposed to light and air. As soon as they are large enough, they should either be potted off singly into six inch pots or they may be planted out in any position fully exposed to the sun, not less than 12 or 15 inches apart, they must be kept liberally supplied with water during dry weather and an occasional dose of weak liquid manure will tend to the production of fine fruit. It must, however, be borne in mind that where very large specimens are required, not more than two or three fruits must be allowed to mature on the strongest plants, and if the plants are weak, only one fruit should be allowed to remain. In the Hills, seed may be sown during April and May, but at any elevation over 5,000 feet, it is very difficult to induce them to ripen their fruit outside, though under glass, or even with the slight protection afforded by a south verandah, very fine specimens may be grown.

VARIETIES.



LONG RED,—CHILI.—CAYENNE
colour, making a very handsome appearance both in growth and on the table, very productive, fruit of a mild, sweet flavour.

CHILI.—Bright scarlet, small.
CHIFRY SHAPED.—Very ornamental as a pot plant.

CAYENNE.—Small tapering fruit, very hot.

CELESTIAL.—A very fine new variety, fruit of medium size, borne in the greatest profusion, the fruit when young are of a creamy yellow colour turning to a vivid scarlet as they mature.

LONG RED and LONG YELLOW—The best for general use.

GOLDEN DAWN.—In shape resembling the "Sweet Mountain" of a beautiful golden yellow

GOLDEN UPRIGHT.—The Golden Upright, introduced in 1887 for the first time, is a decided advance upon the best yellow capsicum (Golden Dawn) previously known. Not only so, but it also introduced an entirely distinct and novel type. Unlike all other large varieties previously known, the fruit grow upright on stiff stems.

MONSTROUS RED.—On good soil will grow 6 inches long

PRINCE OF WALES.—A very ornamental variety, especially when grown in pots, fruit pale yellow.

RED CLUSTER.—This is one of the most distinct and beautiful varieties I have ever seen. The small thin fruits of a conspicuous coral red color, are curiously crowded together in bunches at the top of each branch, a single plant will bear hundreds of these handsome little peppers, which are very hot and pungent in flavour.

SWEET MOUNTAIN.—A very large variety, of exceedingly mild flavour, one of the best.

PROCOFF'S GIANT.—This giant-fruited variety might well be termed the *Goliath* among Capsicums. Specimens of this have been exhibited nine inches long and three inches thick, the average length being 6 to 8 inches. The fruits are of a glossy scarlet colour, sweet and mild in flavour, flesh very thick.

RUBY KING—Handsome fruits, of a bright, ruby red color. The fruit ordinarily grows 4 to 6 inches long by 3 to 4 inches through. Added to their beautiful color, when ripe, is the great desideratum that they are remarkably mild and pleasant to the taste ; in this respect they are unequalled by any other Red variety.

TOMATO FORMED.—Large square fruits, red or yellow.

TOM THUMB.—A handsome new variety, well adapted for pot culture.

WONDERFUL.—A new variety introduced recently in America. Similar to Celestial, but with fruit about double the size of that variety.

CARDOON (*Cynara cardunculus*.)

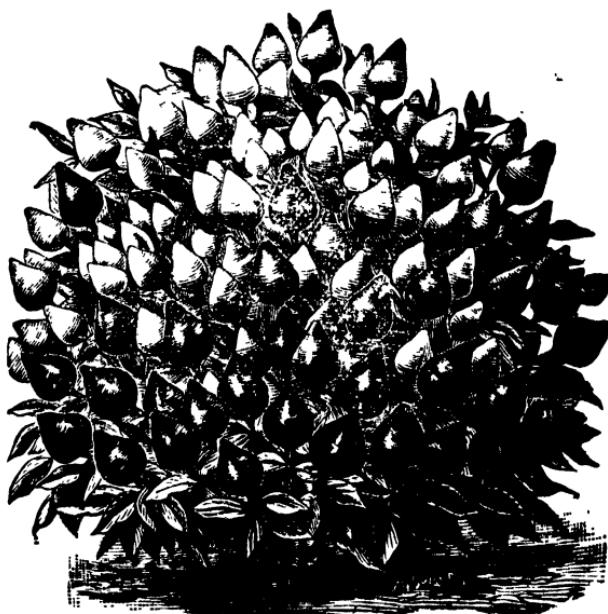
A plant closely allied to the Artichoke and much resembling it in its foliage. It is extensively cultivated on the Continent, but is little known in England, and is but rarely, if ever seen in India.

The Cardoon, if treated in the same manner as celery, will generally be found to succeed: the only difference there is exists in the blanching, which requires rather more care and trouble than are generally bestowed upon celery. Thorough blanching is, however essential, in order to bring out the delicacy of flavour possessed by the Cardoon, without which it is worthless. It is better to have small heads well blanched and crisp than to have large rank ones half blanched, and consequently tough and strong. In order to have good tender heads, it is necessary to grow the plants from the beginning to the time of blanching without a check, and this can only be done by planting them in deep, rich soil, and keeping them well supplied with water at the roots during dry weather.





MONSTROSUM



CAPSICUM, WONDE



Sweet Mountain



New Celestial



Golden Dawn

CARROT (*Daucus carota.*)

VERN.—GAJUR—SHOONDAR.

This vegetable requires a deep, rich, light, sandy soil, and one that has been heavily manured the season previously suits it best. In preparing the ground for them it should be trenched to a depth of two feet for long varieties, and about twelve inches for the short kinds. Care must be taken that the soil is carefully broken up and pulverised finely. If the soil has been liberally manured for the previous crop, and is moderately rich, no fresh dressing should be given, as fresh manure has a tendency to cause the roots to become forked. When, however, the soil is poor, a liberal supply of very old leaf mould or cow manure should be added. This must be placed about six inches below the surface, as it will then have the effect of drawing the young roots downward. To promote a vigorous youthful growth, and enable the young plants to grow freely, some recommend that the drills be drawn deep enough to allow of a small quantity of well-rotted manure being placed at the bottom, and after covering this with a little fine soil, the seed should be sown.

Previous to doing this, however, a good dressing of soot should be given, as it is not only a most powerful fertiliser, but is very obnoxious to insects, and particularly such as affect Carrots. By its use I have had splendid crops in situations, where without it, they would have been eaten up or so damaged, as to be comparatively worthless; whether it kills the grub of the wireworm or not, I cannot say, but if not, these pests vacate the soil and betake themselves to fresh fields and pastures new. From my experience of soot, I am convinced it is not half enough used in gardens; as, were it more liberally applied, we should not have the bother we have with slugs and such like, devouring the young plants the moment they make their appearance.

The first sowing of the Horn varieties may be made on a raised bed early in September, and successional sowings every ten days thereafter. Sowings of the long kinds should be commenced in October. To induce the seed to germinate quickly, it should be steeped in water for six or eight hours before sowing; it must then be thoroughly mixed with ashes or dry sand and sown in drills nine inches apart for the small kinds, and twelve inches for the larger sorts. As soon as the plants are three or four inches high, they should be thinned out to a distance of six inches between them. The crop must be kept clear of weeds, and the soil frequently stirred around the roots; they must also be kept liberally supplied with water during the whole period of their growth.

As soon as they have attained maturity, they should be carefully taken up without damaging the roots, and after cutting off

the tops to within an inch of the crown and allowed to dry in the sun for two or three days, should then be stored in dry earth or sand for future use.

EARLY VARIETIES.

CARENTAN.—Somewhat larger than Short Horn, almost cylindrical in shape, stump rooted, with small top and very few leaves.

CHANTRY OR MODEL.—For table use it is probably the best in shape and finest in quality of all. These Carrots have attained such a uniformity that they are almost duplicates of each other. They are a little longer than the Short Horn, being thicker at the shoulder and hence more productive; always very smooth and fine in texture and easily dug; the flesh is tender and of a beautiful, deep golden orange.

DANVER'S HALF-LONG SCARLET.—An intermediate or half long variety of handsome form, of a bright orange red colour and very productive. A very desirable variety.

EARLIEST PARIS.—This is undoubtedly a great acquisition as an early crop variety, being ready for use in from 6 to 7 weeks from the time of sowing; the roots are small, almost perfectly round, splendid flavour and fine colour.

EARLY FRENCH SCARLET HORN.—This has always been the general favorite for an early crop; it is of a bright orange color, of delicate flavour, and will grow in less depth of soil than any other variety owing to the shortness of the root.

EARLY ENGLISH HORN. } Good reliable sorts, coming into use after the
EARLY DUTCH HORN } preceding.

EARLY HALF-LONG LUC. A new French variety, of a beautiful half long shape, bright orange red color and stump-rooted. Is quite early and a desirable variety.

JAMES' SCARLET OR INTERMEDIATE.—A very superior variety of medium length and fine flavour; one of the best for general use.

SCARLET NANTES.—A first rate second early variety; root almost perfectly cylindrical, with fine neck hollowed out around the leaf-stalks.

SUTTON'S NEW INTERMEDIATE.—An improved form of James' Scarlet, larger in size and of superior quality.

VARIETIES FOR GENERAL CROP.

ALTRINGHAM.—A good old variety, full colour and flavour, must be planted in very deep soil.

LONG RED SURREY.—Very long, narrowing gradually to the lower extremity; requires a good deep soil.

NEW LONG RED, WITHOUT CORE.—A very fine new variety, of a peculiar habit, growing about nine inches in length and cylindrical in shape, stump-rooted and almost entirely free from heart.

ORANGE GIANT.—Very large, of superior flavour.

OX-HEART OR GUERANDE.—This new Carrot comes from France and is a decided advance in shape, as shown in the illustration. It is intermediate as to length between the half-long varieties (such as Danvers) and the short Horn Carrot, but much thicker than the latter attaining, at the top from three to four inches in diameter. It is of very fine quality for table use.

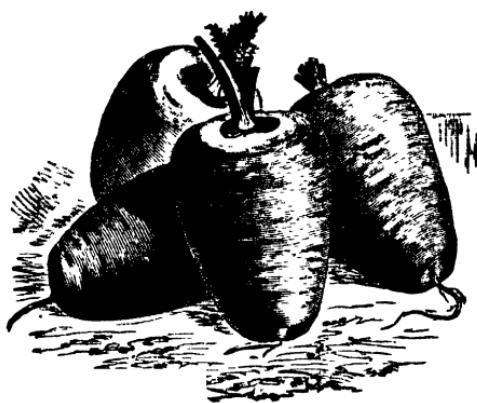
SAINT VALERY OR NEW INTERMEDIATE.—The roots grow very regular and smooth, they are of good size, being from ten to twelve inches in length and two to three inches in diameter at the top, tapering gradually from the shoulder to the tip of the root. Very valuable, not only for its great productiveness, but also for its rich, handsome color and its sweet, tender flesh.



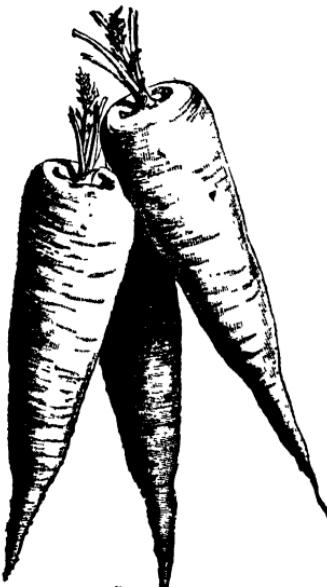
Earliest Paris.



Half Long Luc.



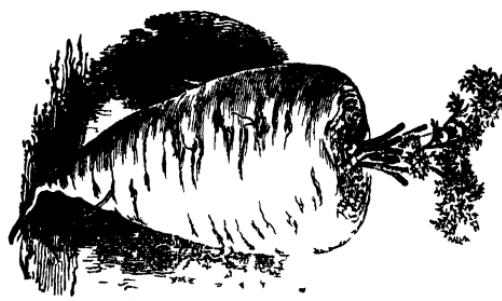
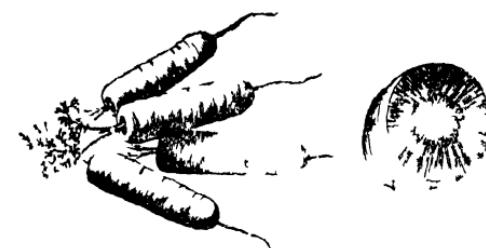
Ox-Heart or Guerande.



St. Valery.



Danvers.



THE CAULIFLOWER (*Brassica oleracea botrytis cauliflora.*)

VERN,—PHOOL KOBEE.

The most popular of all European vegetables in this country, the *Phool Kober*, is prized alike by all classes of society, even entering into the heterogeneous mass of the mild Hindoo's curry, when it comes within the scope of his slender purse.

The Cauliflower is chiefly grown in Lower Bengal from acclimatised seed, and when really good seed is procured will produce heads of the greatest perfection under good cultivation. It is generally believed that it is impossible to produce good heads from plants raised from imported seed, and even Firminger mentions it in his "Manual of Gardening." From my own experience I should say this is quite a fallacious idea, although it must be admitted the plants require more care and attention than those raised from acclimatised seed. To grow it well it requires the richest of soils, with a liberal supply of root moisture throughout its whole growth. To insure this, heavily manured ground is of the first importance, and liberal dressings of liquid manure should be frequently applied. The first sowings should be made about the same time as that mentioned for the Cabbage, and as soon as the seedlings are large enough to handle, they should be transplanted into a bed of light, rich soil, at a distance of four inches apart each way. As soon as they have made four perfect leaves, they may be again transplanted into a bed of richer soil than the one first employed. This time they should be placed six to eight inches apart; here they may remain until they are strong enough to be planted out in the quarters where they are intended to be grown. Should, however, time and labour be available, a third transplanting will even be beneficial to the plants. The object gained by frequent transplanting is, that it prevents a too luxuriant growth of the foliage, and induces them to heart more freely and quickly.

When very early Cauliflowers are required, I have found the following a very successful method of producing them:—Fill a quantity of three-inch pots with light, rich soil, and in the centre of each row three or four seeds of any good acclimatised variety. As soon as these have germinated, select the strongest plant, and remove all the others. When they commence growing freely, weak liquid manure may be given. As they increase in size they should be continually shifted into larger pots. Seed sown in this way at the end of August will, by the end of the rains, have produced strong plants, nine to twelve inches in height, which should then be in six-inch pots. As soon as the weather has become quite settled, these should be planted out in trenches

in the open ground as previously described, when, in the course of seven to eight weeks, they will produce fine heads. Many will probably think this is a laborious process, but the fact that by so doing you may have Cauliflowers on your table quite a month before your neighbours, is a victory well worth winning. Our native gardeners have great faith in the efficacy of mustard cake, or *khullee*, as a manure for Cauliflowers, and in fact for every member of the Cabbage family. It undoubtedly is a very powerful stimulant, and very quick in its action. They generally apply it when the plants are about half grown, by removing the soil for about six inches round the roots, giving about half a pound to each plant. This is then covered with the soil, and a copious watering given.

In the North-West Provinces, Punjab, many parts of the Deccan and the Madras Presidency imported cauliflower seed of almost every variety grow to perfection, producing heads far superior in quality and size to any that can be grown from acclimatised seed, the great point is to select varieties suitable to the locality for which they are required, for instance in districts where the cold season sets in late and is but of short duration, only early or second early varieties should be selected, in more favored localities having a long cold season, late crop kinds may form the larger portion of those grown, this is a great advantage, as this class comprises some of the best and most reliable sorts in cultivation.

After Cauliflowers are once planted out they require the same treatment as Cabbages under which head ample instructions will be found. In the Hills, seed may be sown from February to April, but unless an ample water supply is available these are at best, but a very uncertain crop, and only varieties belonging to the earliest class should be selected. I prefer, however, to sow in September some hardy kind such as Veitch's Autumn Giant or Large Asiatic, these may be planted out at the same time as winter Cabbages and must be carefully watered till well established, the great point in growing good cauliflowers is never to allow them to receive the slightest check at any period of their growth, plants that have once become stunted from want of water, poverty of soil or any other cause, is a crop lost and to save time and disappointment should at once be consigned to the rubbish heap. The number of varieties in cultivation in Europe is a very large one, every seedsman of note having his own specialities, many of which of course are merely synonyms of old established favorites. In the following list, I have endeavoured to include only well known standard varieties of sterling merit, and one or two novelties of recent introduction that have already made their mark in Europe.



CAULIFLOWER, THE PEARL.



CAULIFLOWER, VEITCH'S AUTUMN GIANT



CAULIFLOWER, HAAGE'S DWARF

EARLY PARIS—The best known of all the early varieties, tender and delicious

EARLY CAULIFLOWER GIANT A splendid new kind that I can recommend with confidence being the largest of all the early varieties, the heads are very solid pure white, and remain a long time fit for use

Second Early Varieties

ECCLISI This new and perfectly distinct variety comes into use about the time of "Veitch's Autumn" but is more self protecting, the heads larger, and pure white. It stands dry hot weather better than any other Cauliflower

ITALIAN GIANT—Extra fine new variety, producing magnificent large white heads, which are firm and close

HALF EARLY PARIS One of the most popular varieties heads very white and compact good for an early or late crop

LENORMAND'S SHORT STEMMED—A superior variety with fine, large, and well formed heads

LENORMAND'S PARIS MARKET An excellent variety with large compact heads, much grown in France not liable to be affected by drought

KING OF CAULIFLOWERS A splendid English variety producing fine solid large white heads very hardy and stands heat and drought well

MONT BLANC This variety is one of the largest and finest Cauliflowers known. Is suitable for a general crop producing large snow white heads, which are well protected by its leaves and of the most delicate flavour. Stem of medium growth leaves long and smooth very desirable

NONPAREIL—A well known variety, highly esteemed, always sure to head.

EARLIEST VARIETIES

EARLY SNOWBALL—An in valuable dwarf Cauliflower, ready to cut in four months from time of sowing producing fine white heads, can be planted very closely

EARLY LONDON—An excellent early variety, heads large, very white and tender

EARLY FRENCH OR DWARF MAMMOTH An excellent dwarf variety, producing a firm white head

HAAGE'S DWARF FAIRY
A handsome dwarf variety, heads very large, solid, pure white, the best



CAULIFLOWER, EARLY SNOWBALL

THE PEARL—Although only introduced last season this variety has become exceedingly popular in England—in form and habit it much resembles that good old variety "Waltham" but is considerably earlier, more sure to head and of the purest white colour, highly recommended

VERGÉS AUTUMN GIANT This extremely valuable variety is perfectly distinct from any other sort—the heads are beautifully white, large, firm and compact and being thoroughly protected by foliage, remain longer fit for use than any other sort

LATE VARIETIES

VERGÉS A really fine variety, sure to head and one of the best for late use—the heads remain firm and solid for a long time. This variety is largely grown and heads well even in locations where the Snowball sometimes fails

ASTATIC An extra large and very fine flowered late variety. This is the finest and most useful Cauliflower ever grown for a late crop and has proved to be decidedly superior to anything at present in cultivation

LATE ITALIAN GIANT Similar to Italian Giant but coming into flower much later if sown at the right time is that variety it will form a good succession crop to it

CAVÉ MALLA The largest variety in cultivation heads of good shape and very solid pure white when young but as they fully mature become suffused with violet

WACHTEEN—A favorite late variety very hardy, and produces



CAULIFLOWER—VERGÉS

Large, white, firm heads of uniform closeness

CELLERY, (*Apium Graveolens*)

VERGÉS, SHALAKI, UJOLAI, SHOBHÉ, KURKU

Few vegetables are more benefitted by good culture than the above. If it receives any check during its entire growth, the result is that it either becomes tasteless or stringy, or boits, and not unfrequently both. The first sowing should be made in pans in July, the seed at this period will, however, frequently take from five to six weeks to germinate. As soon as the plants are large enough to handle they should be transplanted to a nursery bed, where they may remain till large enough to be planted in the trenches. They must, however, be carefully protected with mats during the continuance of heavy rains, the main sowing should be made in the open ground by the first week of September. The seed at this time will germinate more quickly, and the plants will not be more than ten days or a fortnight behind the first

sowing. When the plants are five to six inches in height, trenches must be prepared to finally plant them into. The trenches should be from nine to twelve inches deep and about fifteen inches wide, the soil from which should be placed evenly on each side: then add four or five inches of thoroughly decomposed rich manure. This must be well dug in and thoroughly incorporated with the soil. The plants may then be planted at once.

It is a very common practice to dig Celery trenches too deep;

this should, however, be guarded against, especially for late crops, and when the soil is of a wet nature, for if the water cannot readily drain away from the hearts of the plants during wet weather, the Celery will rot, and disappointment be the result. Trenches 6 in. deep after the manure is added, will be deep enough, and this will admit of the trenches between the rows made by earth-ing, being lower than the roots of the plants,



CELERY, SANDRINGHAM DWARF.

by which means good drainage is secured. The width of the trenches and distance apart must be determined by the variety grown, and whether they are to contain single or double rows. For single rows, 15 in. will do, if wider cannot be afforded; and for double rows, 2 ft. apart must be allowed. As Celery is a surface-rooting plant, it is necessary to allow as wide a trench as possible, inasmuch as in narrow trenches the principal feeding roots of the plants soon come in contact with the sides, and thus to a great extent escape the benefit of the manured soil specially intended for them. Good Celery may be grown in trenches 4 ft. apart from centre to centre, but if 5 ft. or 6 ft. can be allowed, all the better. Where ground is limited, the dwarf-growing kinds of Celery are the best to grow.

There is a difference of opinion as to whether it is best to plant in single or double rows. Where large Celery is required the former is doubtless the plan to be preferred, but good Celery,

may be grown by planting double rows 8 in. apart; in this case, however, wider trenches will be necessary. When double rows are planted, it is not advisable to plant in angles, as is often done, but plant two abreast, each pair being not less than 10 in. or 12 in. apart, unless it is a very dwarf variety that is grown. By planting in pairs, the operation of earthing is much more easily accomplished than when in angles, and the roots can be dug up with greater facility. Dull, showery weather is the best time for planting Celery, during which operation the plants should be pressed in firmly, the roots covered 2 in. or 3 in. with earth, a good watering given to settle the soil, and if 1 in. of half-decayed leaves be afterwards spread over the surface, they will prevent evaporation and encourage the surface roots.

Worms being one of the chief enemies of Celery, manure containing them should be avoided as much as possible; thus, if liberal dressings of soot, salt, and lime be mixed with the manure as mentioned, these enemies will be quickly dispelled. Rank manures and strong manure water should be avoided, as they have a tendency to cause the Celery to become spongy and ill-flavoured. Although soil of a rich, sandy nature is best suited to Celery, yet good results may be obtained in almost any well-drained soil.

Care should be taken in taking up the young plants from the nursery bed not to injure the roots in any way; they should therefore be removed with as much soil adhering to them as possible. The principal attention they will require for the next two months will be to supply them with water and liquid manure as frequently as it is possible to do so. Earthing should not be commenced until the plants have attained a height of at least 18 inches: a dry day should be selected for the operation. Before commencing, all the small lower leaves and any side shoots they may have formed should be carefully removed; then proceed by cutting down a portion of the soil on each side of the trench. Break this up finely and place the soil round the base of each plant with the right hand, which should be held in position by the other. Do not press the soil too firmly around the heart, and avoid letting pieces of the soil fall inside the plants, otherwise, in all probability, they will grow crooked. The market gardeners who supply the Calcutta bazaars adopt another method for blanching the plants, which is to mould up the plants in the ordinary way to a height of about four inches only, and as soon as the plants have reached maturity, tie up the remainder of the stem in a plantain leaf.

Another plan and one which on account of its simplicity will certainly recommend itself to public favour, is to place ordinary drainage pipes about twelve inches in length and four inches in diameter, over each plant as soon as it has made its full growth.

By either of these system the heads will blanch more quickly than by the ordinary method of earthing up, but they invariably lack that sweet nutty flavour that should be present in all good Celery. Sow in the Hills from February to June.

WHITE VARIETIES.

BIBBY'S DEFiance.—A very solid variety possessing a rich nutty flavour, stems very stout and crisp, vigorous in growth, and stands heat well.

COLES' CRYSTAL WHITE.—An old variety but still maintains a position in the front rank, is very crisp, juicy and fine flavoured.

DIXON'S MAMMOTH.—The finest of the large growing varieties, attains a height, under good cultivation of fully 3 feet; although so large, it is fully equal in flavour to the best of the dwarf varieties.

GOLDEN DWARF.—A new and very valuable variety, of recent introduction. In habit and growth it is similar to the Half-Dwarf kinds, except when blanched. The heart is large and of a waxy golden yellow, making its appearance exceedingly attractive. It is quite solid, of fine flavour, and keeps well.

HAYWOOD'S QUEEN.—A splendid new variety, grows very compact, and remains fit for use for a very long time, of superior flavour.

INCOMPARABLE DWARF WHITE.—Of stiff, close habit; solid, crisp and

SANDRINGHAM DWARF.—A favourite variety of excellent quality, compact growth, and very solid.

WRIGHT'S GIANT WHITE.—An excellent white variety, forming very large, solid heads, which blanch easily; very crisp and juicy.

WRIGHT'S GROVE WHITE.—One of the best for early use. It is very crisp, and of excellent flavour.

NEW ENDIVE LEAVED.—A peculiar variety with foliage densely curled, heads of medium size and very solid.

SUTTON'S WHITE GEM.—A splendid new kind possessing all the qualities that go to make a first class celery, being of exceptionally fine flavour, crisp, solid and a good keeper.

GOLDEN SELF-BLANCHING.—The beautiful appearance of this plant with its close habit, compact growth and straight, vigorous stalks, is faithfully shown in the illustration. The ribs are perfectly solid, crisp, brittle and of the most delicious flavour, surpassed by no other variety; while it has the merit of being self blanching to a very remarkable degree, without earthing up or any covering whatever, even the outer ribs become of a handsome fresh yellowish white colour. The heart is large, solid and of a rich beautiful golden yellow. The leaves also are of bright yellow after the plant has been blanched, which adds greatly to its appearance when prepared for the table.

HENDERSON'S WHITE PLUME.—A desirable feature of this Celery is that (similar to the *Golden Self-blanching*) naturally its stalk and portions of its inner leaves and heart are white, so that by closing the stalks, by simply drawing the soil up against the plant and pressing it together with the hands, the work of blanching is completed, without, as in most varieties, the additional troublesome process of "banking." It is also ornamental on the table, and is the *earliest* Celery in cultivation.

PERFECTION HEARTWELL.—This new variety is noted for its close habit, compact growth and straight, vigorous stalks, which make a handsome appearance. The heart is large, solid and of a beautiful rich golden yellow color, and without banking up or any covering whatever, even the outer ribs become of a fresh yellowish white color. It is a fine table variety; the ribs are solid, crisp, brittle and of delicious flavour.



Celeraic Erfurt



Celery, Golden Self Blanching



Celery, Coles' Solid Red



Celeraic, Apple Shaped



Celery, Golden Dwarf.

RED VARIETIES.

AYLESBURY PRIZE RED.—Extra fine, a grand Exhibition variety, large, solid, a reliable sort.

MAJOR CLARK'S.—Compact habit, very solid and crisp, delicate flavour, recommended for an early Crop.

INCOMPARABLE CRIMSON.—Very dwarf variety, producing close stalks which are crisp and tender, a very handsome kind when well grown.

WILLIAMS' MATCHLESS RED.—Of medium growth, with fine large heart, crisp, juicy and solid.

COLE'S SOLID RED.—Very solid, large and crisp.

MANCHESTER RED.—A vigorous growing variety, very solid and crisp.

SULHAM PRIZE PINK.—Of medium growth, stiff close habit, remarkably solid, crisp and juicy, and of fine walnut flavour.

WRIGHT'S GROVE RED.—Medium sized variety, of great excellence, deeper in colour than the preceding.

CELERAIC (*Apium Graveolens rapaceum*).

VERN.—KNOLE SHALAREE.

The variety of Celery with bulbous roots known under the name of Celeraic does not seem to find amongst cultivators generally so much favor as it deserves. It requires the same culture as the ordinary varieties except that it needs no earthing up beyond occasionally drawing a little soil round the tubers as they increase in size.

VARIETIES.

ERFURT SWEET.—A very fine variety, producing medium sized roots of a sweet nutty flavour.

PRAGUE GIANT.—The largest variety in cultivation, of good flavour.

NEW APPLE SHAPED.—Very distinct, roots small, perfectly round and smooth, flavour equal to the finest Celery.

CHERVIL (*Scandix Cerefolium*.)

CHERVIL, EXTRA CURLLED.

This plant is but rarely grown in this country for what reason is not quite clear, for there is no more difficulty in its culture than there is in growing Parsley, the same treatment answering for both, except that Chervil must always be sown in the place where it is intended to remain as it can rarely be transplanted successfully. Sow seed

immediately after the cessation of the rains in drills about twelve inches apart and when strong enough thin out the plants in the rows to a distance of 6 or 8 inches apart. The leaves should be ready for cutting in about six to eight weeks from the time of sowing. The leaves are aromatic and are much used for seasoning and in Salads. There are two distinct varieties, the plain, and the curled leaved, the latter should always be grown in preference to the other.

CHICORY (*Cichorium Intybus*)

A very popular vegetable in many parts of Europe but I have never heard of its having been cultivated with any degree of success in this country, though probably it would succeed well in the Hills. There are several distinct varieties, the Red Italian being the kind generally grown for Salads, the large rooted kinds such as the Magdeberg and Brussels, being extensively grown for the manufacture of "Coffee Chicory." This is obtained by cutting the roots into thin slices, which are then roasted and ground. The plant is grown for this purpose principally in France, Belgium and Germany.

CORN SALAD OR FETTICUS.

Another valuable vegetable that is but little

CHICORY LARGE BRUSSELS



CORN SALAD, ITALIAN

known in this country, it is of easy culture requiring the same treatment as Lettuces, but closer together, as all the varieties are of small

may be planted

growth ; as an ingredient in Salads they are certainly superior to many kinds of Lettuces, being entirely devoid of the bitter qualities found in so many varieties of that favorite vegetable. The best kinds are the Broad Leaved, the Italian, and the New Rosette or Cabbaging varieties.

CRESS (*Lepidium sativum*)

VERN.—HALEEM, CHAUSUR.

In the open ground sowings cannot be made safely till the expiration of the rains in October. A small quantity of seed should be sown at short intervals to keep up a regular supply. By adopting, however, the process generally employed in England for forcing it, we may have it in season all the year round. The seed should be sown in pans or boxes filled with a very rich soil ; after being well watered the seed should be scattered thickly over its surface. It must be covered with a pane of glass till the seed germinates. If kept in a shady position, it will grow quickly and be ready for use in from ten to twelve days from the time of sowing. Cultivated in this way, it is much more delicate in flavour than that grown in the open ground.

In the Hills sow out of doors from March to June ; with the protection of a warm verandah, sowings may be made throughout the year.

AMERICAN CRESS (*Barbarea praeoc.*)

This is easily grown in any damp, shady situation in a good sandy soil ; sown at the same time as the ordinary Cress. In flavour, it somewhat resembles the Water Cress, but is decidedly inferior to it, so that when conveniences exist for growing the latter, this may certainly be dispensed with in a garden.

CRESS NEW UPLAND (*Barbarea praeoc.*)

This has recently been introduced as a new vegetable by an American grower, but it appears that it was originally grown nearly fifty years ago in Europe, but from some cause or other it was allowed to die out of cultivation ; why this should have occurred it is certainly difficult to explain, as it is undoubtedly a very valuable esculent, and the nearest approach we have to Water Cress, in fact it is so much like it in flavor as to deceive even experienced judges. It is of very easy culture, under favorable conditions lasting for two or three years, in the plains, however, it can only be grown as an annual, sowings should be made early in October in drills about twelve inches apart in good rich soil.

WATER CRESS (*Nasturtium officinal*).

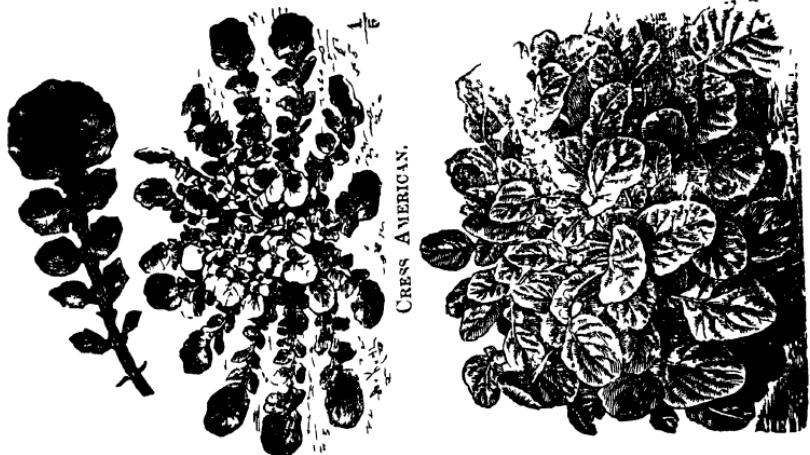
VERN.—PANI HALEEM, JOL HALEEM.

This, although naturally a perennial, can only be successfully cultivated as an annual in this country. The situation best adapted to it is a water-course or drain where there is a regular stream of clear running water. This is, however, next to impossible to obtain here during the cold season. The method, therefore, generally adopted is to sow the seed in *gumlahs*, the soil in which must be kept constantly moist. As soon as the plants are two inches high, they should be transplanted closely into other pans three-fourths filled with a compost made of equal parts of sand, coarsely broken brick, and leaf mould. These should be placed at the edge of a tank, the top of the pans being kept on a level with the surface of the water. Of course as the water sinks in the tank it will be necessary to have the pans occasionally lowered. Another plan which I have seen successfully tried on several occasions, and which possess many advantages in its favor, is to construct a small raft or frame of any common jungle wood. On this securely fasten a tray or box, about six inches in depth, of any size that may be required. This should be filled to within two inches of the top with the same compost as recommended for culture in pans, and the plants transplanted into it in the same way. The only precaution necessary is to see, when the apparatus is complete, that it is so balanced as to keep the surface of the soil slightly below the water level. It may then be moored at the side of the tank or allowed to float about, when, if properly made it forms a pretty ornament. The great advantage of this is, that after the plants are once established, they require no further attention. Where a tank is not available, they may also be grown in pans sunk in the ground. Great care must, however, be taken to keep the soil in them constantly covered with water, and which, to produce a good crop, must be changed daily.

Water cress is indigenous to the Himalayas and may be found in almost every Hill stream at an elevation of from 5,000 to 8,000 feet, it is hardly necessary therefore for me to mention that in gardens where a liberal water supply is available, its culture is extremely simple, seed may be sown in March or April, and in a month or six weeks should be transplanted, taking care that they are liberally watered during dry weather, after the rains once set in they will require no further attention beyond seeing that every shoot, as soon as it is about four inches in length, is taken for use, as if the plants are once allowed to bolt to seed no further crop can be expected from them during the current season.



WATER CRESS.



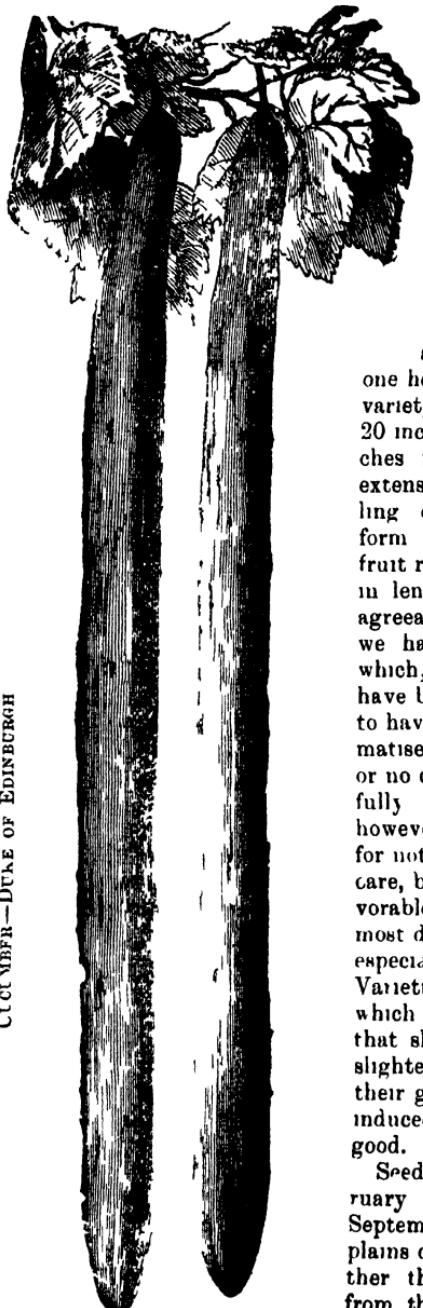
CRESS, AMERICAN.



CRESS, EXTRA CURLED.

CUCUMBER — *Cucumis Sativus*.

VERN — KHEERA OR KHIRA



The Cucumber or 'Kheera is indigenous to this country, and even in its wild state appears to be a plant of very variable habit, so much so as to lead one to believe that there are several distinct species, although all are classed by botanists under one head. In Nepaul we have a variety that grows fully 18 or 20 inches in length and 5 to 6 inches in diameter, this kind is extensively grown in the Darjeeling district, but the ordinary form found in India produces fruit rarely more than two inches in length and of the most disagreeable flavour. In gardens also we have several distinct forms which, if not actually indigenous, have been so long cultivated as to have become thoroughly acclimatised, and require but little or no care to grow them successfully. With imported varieties however the case is very different, for not only do they require great care, but even under the most favourable conditions frequently prove most disappointing, this is more especially the case with the Flame Varieties, the constitutions of which are generally so delicate that should they experience the slightest check at any period of their growth, they can rarely be induced afterwards to do any good.

Seed may be sown from February to June and again from September to December, in the plains during very hot dry weather they will require shading from the full force of the sun,

the simplest and most inexpensive way of doing this is to make up a light wood, frame about three feet square, 15 inches high at back sloping down to 12 inches in front, cover the top with common unbleached calico which should be well stretched and then painted with boiled linseed oil, a frame of this kind will not only prove a great protection from the fierce rays of the sun but will effectually prevent the ravages of many insect pests to which this plant is subject, and for crops grown in the cold season in districts subject to slight frosts, it will be found an efficient protection.

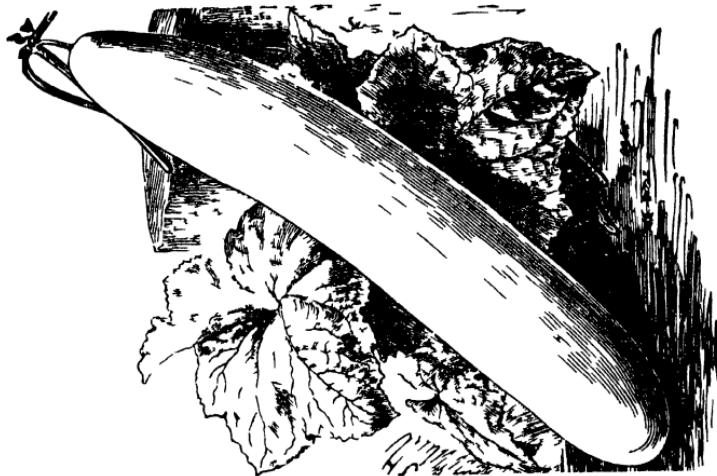
Cucumbers may either be grown on the ground or slightly raised above it on trellises of various sorts, or they may be trained on walls and fences or other vacant places. The surface of the earth is, however, perhaps the best position for them, for there they have congenial warmth, and the leaves are strengthened by the evaporation of moisture from the ground. The foliage as well as the roots are also readily watered in such a position, and the roots are so shaded as to protect them from being scorched by the sun. The necessary training, stopping, and cutting of the fruit are likewise easily attended to when the plants are allowed to ramble freely over the surface.

SOIL AND MANURE.

A great depth of soil is unnecessary for Cucumbers ; indeed, it is to be avoided, for they will succeed far better if they be planted in a little soil at first, and receive frequent top-dressings afterwards ; for planting, 8 in. or 10 in. of soil is quite deep enough if the bed receive slight dressings of stable manure mixed with soil to keep the plants in a vigorous state of health. Good turfy loam mixed with rotten manure is the best material in which to plant them, but the dressing should be of a richer nature.

Cocoa-nut fibre refuse is highly recommended by some as a good dressing for Cucumber beds, but stable manure is by far the best kind of surfacing, and may be applied fresh from the stable, and if a little old mortar or brick rubbish be mixed therewith it will be better still. Weak guano-water is the best kind of stimulant to apply to Cucumbers ; other kinds of manure-water are said to affect the flavour of the fruit. I have found a sprinkling of Standen's Manure over the surface of the bed highly beneficial to plants becoming nearly exhausted. Abundance of water is at all times necessary to Cucumber plants growing under advantageous circumstances.

In the Hills all the finest varieties of Cucumbers may be grown with success, sowings may be made from April to June.



Giant white Cucumber



Paris Pickling Cucumber



Cucumber Long Prickly

VARIETIES OF CUCUMBERS.

In consequence of so many so-called new varieties of Cucumbers having been recently added to our lists, it is almost an impossibility to say with any amount of certainty which is the best to grow. These varieties of recent introduction are invariably long-growing kinds, suitable for exhibition purposes, but far from being useful to growers whose aim is to keep up a constant supply. For general use a Cucumber 12 in. long is just as good as one twice that length, and where one long one is grown, two or three short ones may be had with less injury to the plants than the long one.

FRAME VARIETIES.

All the varieties in this class are delicate and should only be grown in places where careful cultivation can be given them.

ARNSTADT GIANT.—A very prolific variety, bearing handsome dark green fruit upwards of 24 inches in length.

DUKE OF EDINBURCH.—Splendid Exhibition variety—fruit growing to the length of thirty-six inches.

SWAN NECK.—One of the longest varieties grown, frequently over a yard in length ; delicate flavour.

TELEGRAPH (*Rollison's*).—A very free bearer, producing fruit from 20 to 26 inches long, of excellent flavour ; the most reliable variety.

TENDER AND TRUE.—A good old variety that never fails to produce a good crop.

HARDY VARIETIES.

These varieties may be grown in the plains at all seasons.

PARIS PICKLING.—A very fine variety producing an immense crop of Small Gherkins only suitable for pickling.

GREEN GIANT.—Fine long fruit, splendid quality.

GREEN LONG PRICKLY.—Very hardy, will grow anywhere.

BEDFORDSHIRE RIDGE.—Medium size fruit, fine flavour.

PARIS GHERKIN.—The best variety for pickles.

LONG ATHENS.—Fruit of medium size and fine flavour, easily grown.

GIANT WHITE.—A variety of recent introduction, fruit very large, frequently attaining a length of 18 inches, skin of a delicate waxy white color.

DANDELION—(*Leontodon Taraxacum.*)

The Dandelion is one of the latest additions to our vegetable

Gardens. It is scarcely twenty years since the idea was started in Paris that this plant could be cultivated and improved. That this result has been attained, any one may easily see by comparing the produce of seeds gathered from the wild plant with that of seeds



DANDELION NEW CABBAGING.

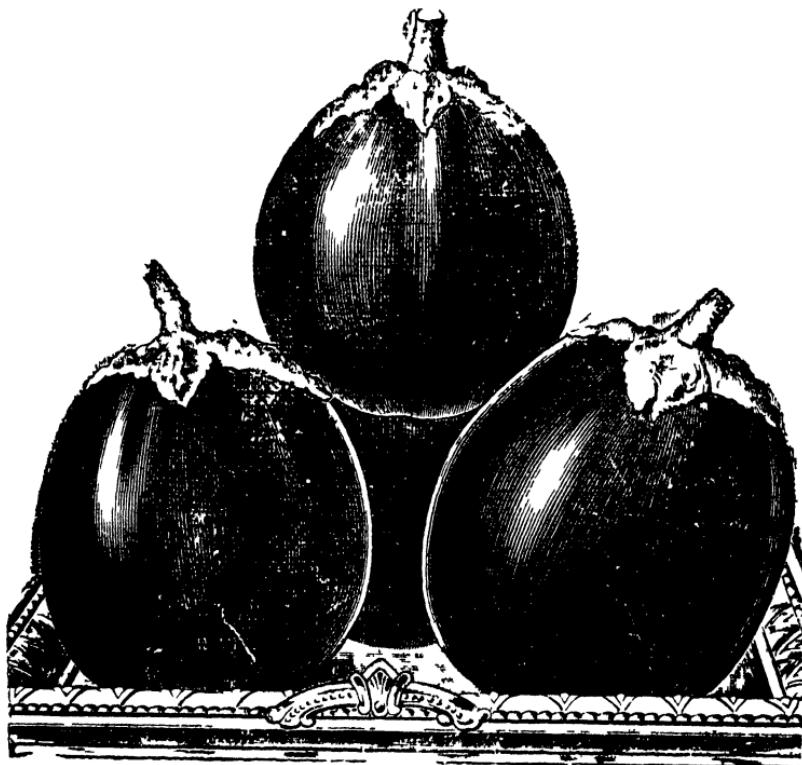
obtained from cultivated plants. As a salad, the Dandelion when well grown and properly blanched, is certainly superior to Endive. In the plains sow at the same time as Lettuces, in good rich soil, thin out to a distance of 12 inch apart each way and as soon as the plants are fully grown blanch in the same way as recommended for Endive. Sow from February to April in the Hills.

EGG PLANT OR BRINJAL.—(*Solanum Melongena*).

VERN.—BAIGOON.

A vegetable very extensively grown in this country, there are several distinct forms which have either originated in India or have been in cultivation here for such a long period, as to have lost all trace of their antecedents. It is only during the past few years that this valuable vegetable has received much attention either in Europe or America, In the latter country, especially in the Southern States, it has now become very popular and it is to our cousins we owe the best varieties yet introduced.

Seed should be sown in a bed of light rich soil and kept well shaded till germination takes place ; when the seedlings are about six inches high they should be planted out to a distance of $2\frac{1}{2}$ to 3 feet apart. In the Hills the Brinjal cannot be grown with any degree of success at an elevation exceeding 4000 feet nor even then, except in warm sheltered valleys.



EGG PLANT, NEW YORK PURPLE.

(ENDIVE *Cichorium indivia.*)

VERN.--KASNI, KURU SALADH.

This is not a very popular vegetable, although it is certainly deserving of more attention than has been bestowed on it in this country. The curled varieties especially are particularly useful, being greatly appreciated by many when cooked in the same way as other green crops, or when well blanched, it makes a salad almost equal to the best Lettuce. The seed may be sown from August to December. For an early supply, the first sowing should be made in pans, and as soon as the plants are two inches high, they must be transplanted into beds of rich soil, to which a liberal dressing of very old manure has been added. They should be placed at a distance of twelve inches apart in the rows. As soon as they have made their full growth they should be closely tied up to blanch in the same manner as Lettuces. Some recommend that the plants after being tied, should be covered with a flower pot to induce them to blanch quickly; provided they are properly looked after, undoubtedly this is the quickest and most certain method of blanching, but if they are at all neglected, and the pots not removed daily and carefully dried, the consequence is that the plants invariably decay. Sow in the Hills from March to May.

There are two distinct types of Endive, one with narrow, curled leaves, the other with broad leaves like those of a Lettuce. The curled-leaved varieties are the handsomest looking, and are more easily blanched than the broad-leaved kind, which require tying in order to blanch them properly. The leaves of the latter are, however, more crisp and better flavoured than those of the former. Among the best of the curled-leaved kinds may



Endive, Giant Naples.

be mentioned Digsowell Prize, Rouen or Staghorn, large Green-curved, and French Moss curved. These are all good sorts, on which reliance may be placed. The last-named is, however, only fit for early and late sowings. The best of the Batavian kinds are Green Batavian, Round-leaved Batavian, and the white Lettuce-leaved Batavian.



Endive, Moss Curled.



Endive, Green Curled.



Endive, Rouen or Staghorn



Endive, White Batavian.

GARLIC—(*Allium Sativum*)

VERN.—LUSSOON, LEHSON.

Garlic or Lussoon is so plentiful and cheap in every native bazaar in India as scarcely to render it necessary to introduce it into our gardens.



GARLIC.

will ripen at the commencement of the hot weather.

Gourds, see Pumpkins.

HORSE-RADISH.—

VERN.—BILATEE SUNJHUNNA.

Horse-radish can rarely be grown in the plains with any measure of success; it may be induced to drag out a lingering miserable existence but never produces roots large enough for use. In the Hills on the contrary, it grows with great vigour and with care, roots may be grown equal to any seen in Europe. The plant likes a good deep rich soil. It is propagated from pieces of the roots.

KALE OR BORECOLE.—

(Brassica oleracea acephala)

VERN.—DAL KOBEE, BARIKHOL.

This is the most hardy section of the whole Brassica family, and is extensively cultivated in Europe for winter use. In this country no object would be gained in cultivating them, as they would come into season about the same time as all the other members of this group, and their quality is decidedly inferior as compared with the Cabbage or Savoy. There are, however,



HORSE RADISH.



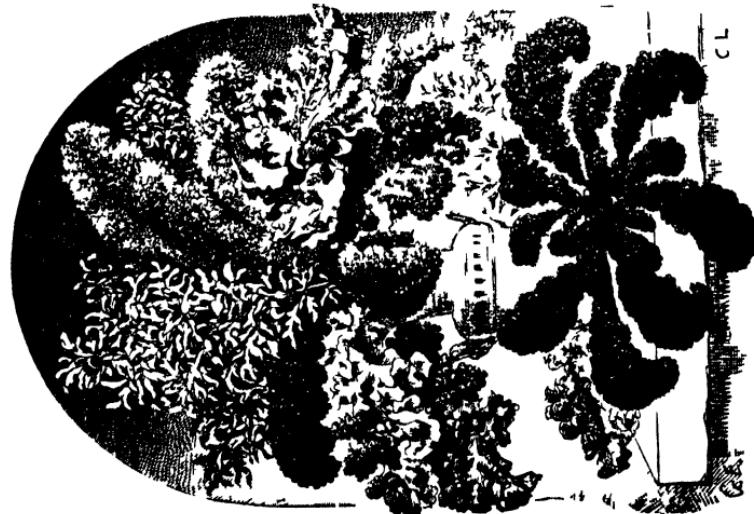
KALE OR BOK CHOY, NO. 2 CUP LEAF



KALE OR BOK CHOY, MONBACH



KALE OR BOK CHOY, PALM TREFF



VARIEGATED KALE.

several very showy and effective variegated leaved varieties, examples of which would tend to enliven the monotony of the kitchen garden, or might be mixed with flowering plants during the cold season. These are also as well adapted for culinary purposes as the ordinary varieties. The kinds most generally grown are Dwarf Green curled, Moss Curled, Mosbach and Palm Tree.

KNOL KOHL OR KOHL RABI—TURNIP-ROOTED CABBAGE.

(*Brassica oleracea caulo rapa.*)

A popular variety of the Cabbage tribe principally valued in this country on account of its coming into season earlier than any other European vegetable. There are two distinct classes of this plant, namely, the green and the purple varieties, some of them growing to an enormous size. These, however, are not suitable for the garden, being very inferior in quality in comparison with the smaller kinds, the best of which are Early White Vienna and Early Purple Vienna.

Its cultivation is the same in all respects as that of the Cabbage, except that when planted out they should only be placed at a distance of eighteen inches between the rows, and about twelve inches from plant to plant. The soil in which they are grown can hardly be made too rich; and as soon as the plants commence growing freely, they should be supplied with frequent dressings of strong liquid manure, the great object being to induce the plants to make a rapid vigorous growth, otherwise they invariably become tough and fibrous. They are best suited for the table when about the size of a cricket ball.

LEEK.—(*Allium porrum*)

VERN, SUNDAY, KUNDANIL.

The Leek is but little cultivated in Bengal, and is rarely to be

found in our markets. This is certainly not owing to any difficulty in its cultivation, for, provided good seed is procured, it can be grown most successfully with proper treatment.



Seed should be sown early in October, or as soon as the rains are over, in a light rich soil. When the plants are about six inches high, they

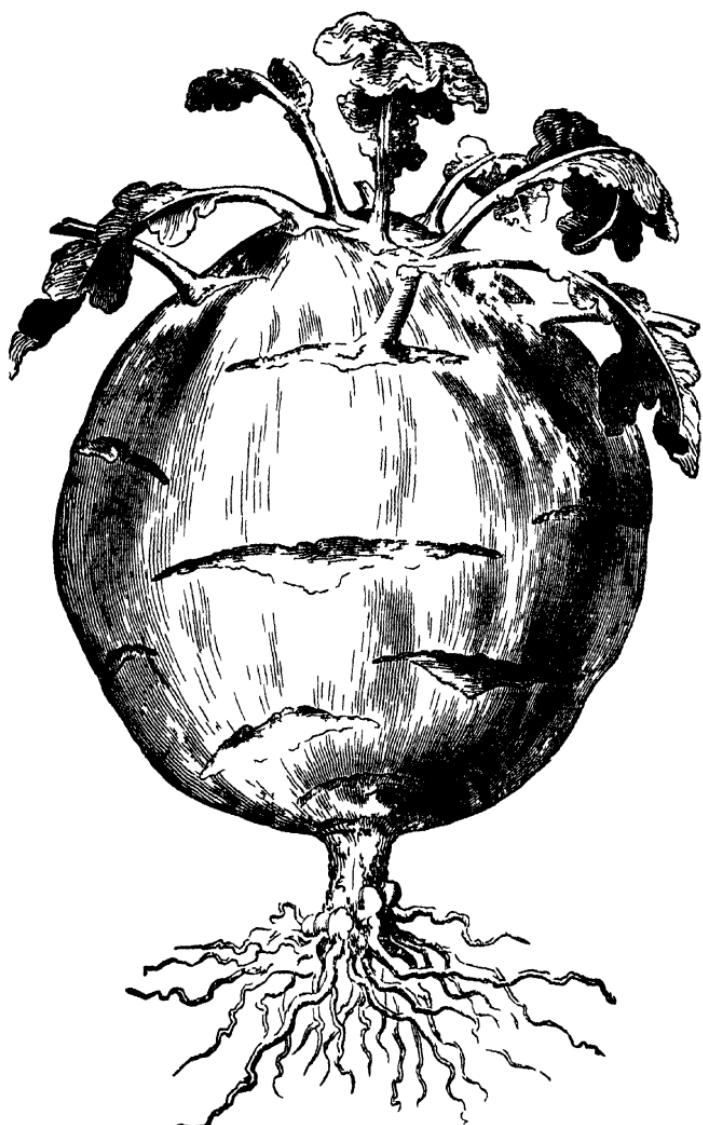
should be transplanted into trenches prepared in the same way as for Celery, but they need not be more than eight inches wide. The plants should be placed in the rows at a distance of not more than five or six inches apart. In planting, the seedlings should be placed at least three inches deep in the soil, and as they increase in growth, should have some light, rich soil drawn round the stems to insure their being properly blanched. They must be kept liberally supplied with water, and are also much benefited by frequent dressings of strong liquid manure.

There are several kinds of Leeks, as the Musselburgh, London Flag, Ayton Castle Giant, Large Rouen, and others, all garden selections from the original species—*Allium Pororum*, and perhaps *A. sativum* and *A. lineare*, either of which will develop into fine Leeks if well cultivated. There are few plants that pay better for liberal treatment, or sooner resent neglect in any shape, than Leeks. The soil in which it is intended to grow them should be lighter than that in which Onions are generally cultivated, and they thrive best in alluvial deposits of rich black earth thoroughly impregnated with decomposed manure. What is known as rank manure is not at all suitable.

LETTUCE—(*Lactuca sativa*.)

VERN.—SALADH.

Lettuces are especially partial to an open deeply worked and well enriched soil and to an abundant supply of moisture throughout their whole growth. Not only is this necessary to insure a free growth, but also to secure such an amount of crispness and natural succulence as alone constitute the highest merits of this important salad plant. The Lettuce is divided into two distinct groups, namely, the Cos. and the Cabbage varieties, both of which thrive equally well in this country, although probably the Cabbage varieties are best adapted for very early crops, being of a hardier nature. Sowings may be made for an early crop in pans or boxes in August or September, and as soon as they have formed four leaves, should be transplanted into well raised beds. They must, however, be protected from heavy rains, otherwise they are liable to damp off. For main crops after the rains are over, sowings should be made in the open ground in drills twelve inches apart. As soon as the plants are sufficiently strong they should be thinned out in the rows, leaving nine to twelve inches between the plants of the Cos varieties, and fifteen inches for the larger kinds of Cabbage. The plants that are removed from the drills should be transplanted into a bed of rich soil and carefully shaded for three or four days. These will form a good successional crop to



Kohl Rabi, Sanders' Green Short Top

those left in the original bed, although they will not be equal to them in size, as the finest Lettuces are always produced from the plants that are allowed to remain in the place where the seed is sown. As soon as the plants are large enough, a few should be tied up at intervals of three or four days to blanch them. This operation must only be performed when the plants are quite dry; it is therefore best done in the afternoon of a bright sunny day. After being tied up care must be taken not to water the plants overhead, otherwise, the water settling between the leaves frequently causes the hearts to rot.

The red ant is particularly partial to the seed of this plant, and in gardens much infested with this insect it is almost impossible to raise plants in the open ground. In such a case it is necessary to sow the seed in pans or boxes filled with coarse soorkee or gravel, to which may be added a small quantity of leaf mould. These must be placed in such a position that the ants cannot get to them; this is easily managed by procuring *gumlahs* about the size of ordinary seed pans; fill these with water and then invert an ordinary six or eight inch flower pot in each, on which must be placed the pans or boxes. If care is taken that the *gumlahs* are kept constantly filled with water, this will form an effectual barrier to ants or any other insect.

The principal aim should be to keep the crop growing, not allowing a check to take place, for, when once that occurs, time is lost, size is sacrificed, and the quality is always inferior. This especially applies to leaves half or three parts grown, as such can never be made to regain their pristine crispness if once they suffer from want of moisture. From a thoroughly well-grown Lettuce there is not much waste, but when indifferently grown the half, perhaps, of each head is sacrificed; it will therefore be easily seen how necessary good culture is for those who wish to economise time and labour. I would therefore again forcibly recommend the utmost attention to be paid to the preparation and enriching of the soil together with timely watering, without which no one can think of succeeding in Lettuce culture with any decree of certainty. Much labour may be saved if mulching be practised for the later crops; in fact, without this aid it would be almost useless to attempt to grow good Lettuces in some seasons; manure is best if it can be had, if not, short grass or litter of any kind. Although mulching is recognised as beneficial, and much is continually being urged in its favour, it has not yet been carried out so extensively in this country, and that more especially with respect to quick-growing crops, as it ought to be; indeed, so valuable is its agency, that in continued dry weather, and under a burning sun I have seen crops gathered in such perfection as almost to appear incredible.



Burpee's Tomhannock Lettuce



Lettuce, Magnum Bonum



Lettuce, Paris White Cos



Lettuce Neapolitan



VII Lettuce Naples Cos



Lettuce, Balloon' Cos



Lettuce, Early Ohio



Lettuce, New Oak Leaved.



Lettuce, Californian Curled



Lettuce, Royal Cabbage.



Cabbage Lettuce, Blonde de Berlin



Lettuce, Imperial Cabbage

LETTUCES.—VARIETIES.

There are three classes of Lettuces, viz. :—1, Cabbage Lettuces (*Lactuca sativa capitata*) ; 2, Cos Lettuces (*Lactuca sativa romana*) ; 3, Cut-leaved Lettuces (*Lactuca sativa foliosa*) ; each class consisting of an indefinite number of varieties. Other classes could easily be made were the colour of the seed taken into account and the curled varieties ; but this would only complicate the descriptions already too much confused. Each variety being popular in certain localities, I have described a great many ; but still I have been careful to select the best. Old varieties, of doubtful value or name, for want of accurate descriptions, have been omitted. Two centuries ago only some dozen varieties were described, some of which are still under cultivation with new names. At the end of the eighteenth century, a collection of 100 varieties could easily have been procured from France, Germany, and Holland ; and at the present day over 200 varieties are in cultivation, exclusive of some 600 synonyms. Most of these have originated in France, Germany, and Holland ; a few come from America, and a very few have been raised in England.

CABBAGE VARIETIES.

BLONDE DE BERLIN.—A splendid Lettuce introduced from Germany, where it is extensively used. Leaves pale green, with yellow edges, folding into a close and compact heart. Crisp, sweet, and does not run to seed quickly.

CYRIUS GIANT.—A very fine variety, producing a medium sized heart, delicate flavour.

COMMODORE NUTT.—Compact, early and excellent flavour, invaluable for small gardens.

EARLY OHIO.—A very reliable variety, heads of medium size, very much curled, flavour all that can be desired.

EMPEROR.—One of the largest varieties known, hearts quickly, the best for general Crop.

GOLDEN PRINCESS.—This is a very distinct sort, making a large dense yellow head, very crisp and tender and excellent in flavour. Its beautiful yellow heads give it a very handsome appearance.

IMPROVED PERPIGNAN.—A splendid kind and a great improvement on the old "Perpignan," forms a large, solid heart which will stand for weeks.

IMPROVED ROYAL CABRAGE.—A very celebrated variety, forming fine, large, solid heads, both crisp and fine flavour ; stands the heat remarkably well.

LARGE INDIA CURLLED.—This forms the most noble head in the whole Lettuce tribe ; it is not early, but requires heat to make it crisp ; the leaves are beautifully curled, and, when well grown, the heads will frequently attain eighteen inches in diameter.

NEAPOLITAN.—Grows to a large size, and is very crisp and tender.

PELLETIER.—A fine new continental variety, heads large, very solid, and of extra fine flavour.

SALAMANDER.—A grand Lettuce for summer use, forming good sized, compact heads. Color, light green outside, and white on the inside. Its great merit, however, is that it will withstand drought and heat, and remain longer in head than any variety I have ever met with.

SPOTTED CABBAGE.—A very compact variety with round twisted leaves, forming a close and very tender head. The inner leaves are almost white, and are streaked with bright red, the outer ones are of a dark green with brown blotches.

SILVER BALL.—A very fine variety producing a medium sized solid head of excellent quality and nearly pure white.

STONEHEAD.—A very compact, solid variety, producing a fine heart, very hardy.

TOMHANNOCK.—An American variety, intermediate between the Cabbage and Cos class—quite distinct and well worth growing.

ROYAL WHITE SUMMER CABBAGE.—A very crisp and fine flavoured variety.

Tom THUMB.—Early compact, stands a long time; a very useful sort and the best of the small-growing varieties.

VICTORIA.—Black seeded; a good and very useful variety, stands the heat well.

WHITE CHAVIGNY.—This is a very fine variety, regular in shape, quick in forming the head, slow in running to seed, very compact in growth and of fine flavour, entirely free from bitterness.

OAKLEAVED.—A distinct variety due to the peculiar outline of the leaves, which are shaped like those of the Oak. The heads are compact, crisp and tender, and it is free from that bitter taste so peculiar to many kinds of Lettuces.

COS VARIETIES.

ALEXANDRA.—A superior variety, large and very crisp.

CRYSTAL Cos.—The best flavoured of all the varieties of this section, heads large and full, but requires tying to blanch well.

COOLING'S LEVIATHIAN.—A very hardy variety of immense size, when well grown, quality is superb but does not succeed well in a poor soil.

FLORENCE OR MAGNUM BONUM.—Very large and crisp, requires no tying, a good variety.

GIANT NAPLES.—The largest and best folding Lettuce nearly double the size of other varieties; should be planted 18 inches apart each way.

KINGSHOLM.—Extra large and good quality, a grand variety for exhibition.

LONDON WHITE Cos.—A very large variety, early and crisp; blanches well and is slow to run to seed.

NEW BALLOON Cos.—Head is very large, rather flat on the top, and very firm; crisp and tender.

PARIS GREEN.—Similar in habit to the Paris White Cos, but does not attain to such a large size; and the foliage is of a dark green colour.

PARIS WHITE.—Hearts and blanches well without tying; is crisp and excellent; one of the best varieties. Well grown plants sometimes weigh as much as six pounds.

GATHERING LETTUCES.

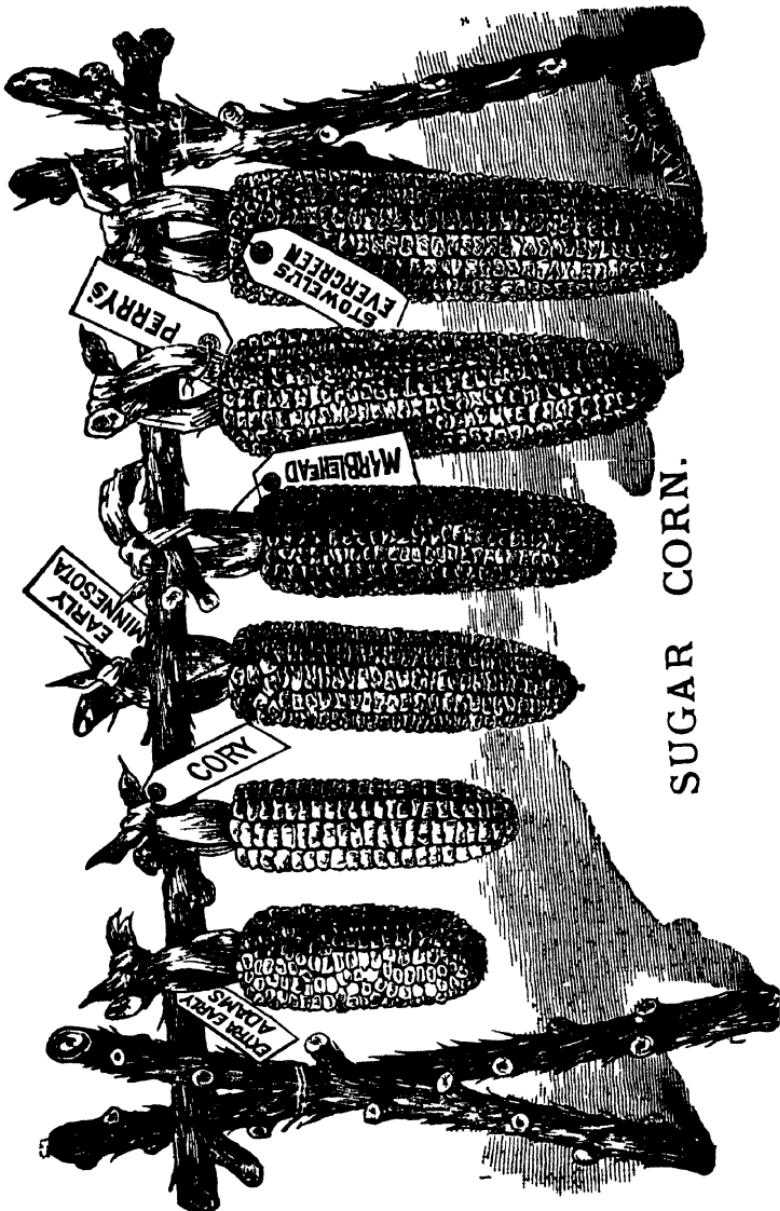
These form an entirely distinct class, and grow to a very large size. The lower leaves pulled off successively furnish salads through an entire season.

AMERICAN GATHERING OR CURLLED.—A distinct and interesting variety. It is intermediate between the Cos and Cabbage kinds, exceedingly tender and fine flavoured. The dense globular-formed plants, with their delicate and crisp light green leaves, edged with violet, form particularly pretty objects.

CALIFORNIAN.—Similar to the preceding but darker in colour and more hardy.

AUSTRALIAN CURLLED.—New, light yellow, and possessing the same qualities as the American sort.

SUGAR CORN.



MAIZE OR INDIAN CORN (*Zea mays*.)

VERN—(BHOOTA, MUKKA.)

This plant is so well known to every native gardener that it is hardly necessary to mention anything regarding its cultivation here. The sorts generally found in our gardens are the small seeded varieties so extensively grown as a field crop in almost every part of India. These are, however, very inferior both in point of size and quality to the many splendid varieties imported from America; which whenever procurable, should be grown in preference to any other.



The best time for sowing is at the commencement of June, before the rains set in, but successional sowings may be made till September, although the produce will be inferior to that of the first sowing. Firminger recommends that the seed should be sown in rows twelve inches apart, and the grains eight inches in the rows. From my own experience I should say the crop would thereby be considerably too crowded; even a distance of eighteen inches each way will not be found too much. An American writer thus describes their method of cultivation: "Plant in drills about three feet apart; place a shovelful of manure or a handful of Pou-drette in each—five or six grains to a drill is sufficient. When up, thin them out, allowing three of the strongest plants to remain. Thorough cultivation is necessary to secure a good crop."

Sow in the Hills at the same time as recommended for the plains. The following selection comprises the most popular of the varieties now grown in America, all of these are suitable for table use.

EARLY ADAMS OR BURLINGTON.—This variety is not a sweet corn, but is largely sold for table use. It is very hardy, with white grain and short ear, and matures in sixty days.

THE CORY.—The earliest sweet corn in cultivation; it is a week to ten days earlier than the Marblehead, and much sweeter and finer quality. Ears are larger than either the Marblehead or Minnesota.

EARLY MINNESOTA.—The standard early variety, eight-rowed, ears of good size, sweet and fine flavored, and ripens a little earlier than the Crosby. A desirable variety being highly productive and of good quality.

EARLY MARBLEHEAD.—Until the introduction of the Cory, this was the earliest variety of sugar corn in cultivation. Its stalks are about four feet high, ears of medium size, and set low down. Roasting ears have been picked in sixty-one day's from time of planting while the ordinary time required for maturing is seventy days.—A valuable variety to come in ahead of Minnesota.

PERRY'S HYBRID.—A fine variety, nearly as early as the Minnesota, bearing ears much larger, which are well filled to the end. The cob is red, having twelve to fourteen rows of large white kernels. The ears are set low down and bear two to a stalk.

STOWELL'S EVERGREEN.—The most popular variety for a late sort in cultivation. One that is more largely planted than any other, it being the favorite for late use. This variety is a necessity for every garden for a succession. The ears are large, grain deep, sugary and tender.

MAMMOTH LATE.—This produces the largest ears of any Sweet Corn, a single ear sometimes weighing as much as two to three pounds. It ripens a little later than the Evergreen and the cobs are larger, the kernels being flatter, not horse-tooth shape.

SHAKER'S EARLY, OR PREMIER EARLY.—An extra early variety with large, well-field ears; the kernels are of pearly whiteness and most delicious sweet flavour. It is ready fully as early as the Early Minnesota, while the ears are very much larger.

THE MELON (*Cucumis melo.*)

Innumerable attempts have been made in this country to cultivate the many varieties of Melon now so much grown in England, but almost invariably without success. There are various reasons adduced as to the cause of this—some attributing it to the climate, others to the ravages of a particular kind of beetle, which, strange to say, has a happy knack of always turning up wherever a plant of the Melon or Cucumber family grown from imported seed is to be found, and yet they leave plants raised from indigenous seed entirely unmolested. Possibly this insect acts on the same principle as the mosquito, which is well known to have a peculiar penchant for new comers. I do not think either of these reasons sufficient to account for such an invariable failure—in the first place as regards climate. In England they are generally grown at an average day temperature of eighty-five and a night temperature of about seventy degrees. In most parts of Bengal, at certain seasons of the year, there would be but little difficulty in keeping a glass house or frame at the above temperature, and with reference to the insect theory, it is certainly, if not actually, a myth—at least considerably over-estimated, for, admitting the presence of the pest, still it is quite easy to protect the plants from its ravages.

Till such time as some better reason is brought forward to thoroughly convince the most sceptical of the impracticability of its culture, we ought certainly to persevere, as possibly by some

happy chapter of accidents it may eventually fall to the lot of some fortunate amateur to discover a method by which we may be able to have a "Hero of Bath" or "Scarlet Gem" on our tables at a tenth of the cost it takes to produce them by our more fortunate friends at home.

On one occasion I was successful in getting a plant to ripen three medium sized fruits, and although these were not equal in flavor to what we should expect in England, still they were immeasurably superior to the ordinary country varieties. The plant was grown on a gentle hot bed of leaves and stable manure covered with a glass frame, similar to those used for cucumber growing in Europe. This frame was kept constantly covered with a screen of mosquito net to prevent the possibility of any insects obtaining ingress, as the flowers expanded they were artificially hybridised; originally six fruits set properly, but to prevent any undue strain on the plant the three weakest were removed.

Fortunately the many American varieties, most of which belong to the cantaloup family, possess a more hardy constitution, although they may lack to a certain degree the delicate flavour of the English kinds. These may be grown successfully in almost any part of India provided they are protected from the ravages of insects during the early stages of their growth in the same way as recommended for cucumbers. It is advisable to first sow the seeds in pots, three seeds in a six inch pot; as soon as the plants are about six inches high they should be planted out, they require a good rich soil to which a liberal dressing of old manure has been applied, the American system of planting on Hills about 3 feet square and raised 3 to 4 inches above the ground level is the best; in the centre of each hill place the plants taking care to disturb the roots as little as possible when turning them out of the pot.

Watering, must not be carelessly done, during early cultivation they will require liberal supplies, and if the soil be not naturally rich, a little liquid manure occasionally administered will greatly benefit them. Fresh soil should be added as often as the roots show themselves round the sides of the hillocks.

I consider artificial fertilisation very essential at all seasons for insuring a crop of Melons. I do not mean that if the female blossoms be not artificially fertilised you will not have a crop of fruit, but that if you fertilise the blooms you will have them swell off more uniformly—a consideration of some importance, for I have in some instances observed that if one or two fruits take the lead, there has been a difficulty in getting a satisfactory number to swell off. It is a good practice to give a good watering before the flowers begin to open. As to stopping and training, it is presumed that the plants were stopped previous to planting

out; and, supposing them to be stopped at the second rough leaf, they will each push three or four shoots, and these do not travel far before they push laterals, which, if left, only crowd the centre of the plant to no benefit, for these early laterals seldom produce female blooms, and if they did it would not be desirable to retain them, as the plants would not yet be sufficiently established to swell off fruit to perfection. After selecting, say six or eight of the strongest shoots, train them by pegging them down, taking off all the laterals up to about five or six, which leave at the point of each shoot after stopping; it will be found that the laterals now produced are very much stronger than any that have previously showed. These will be sure to produce fruit blossoms, and due attention to setting and after-management will bring the crop to perfection. The number of fruit to be left on each plant must be determined by the sort. As a rule three or four is as much as the plant will ripen. When the fruit approaches maturity, the greater part of the spray-like laterals should be thinned out, at no time should they be allowed to crowd or shade the fruit. It is a good plan to elevate the fruit a little above the foliage, as it keeps drier, and exposes it to the full action of the sun, no fruit being improved more in flavour by sunshine than the Melon.

There are one or two kinds of Melon (*Kurbooz*) extensively grown in this country. These probably originally came from Cabool. They have, however, become quite domesticated here, and require but little care in their cultivation beyond being planted in a light, rich, sandy soil and liberally supplied with water. Closely allied to the Melon we have the Phootee "*Cucumis mormodica*." This is cultivated in the same manner as the preceding, but is very inferior to it in flavour.

VARIETIES.

The following American kinds are those generally grown for out door culture.

EMERALD GEM.—A distinct and deliciously flavored Melon: very early and prolific. Skin ribbed, yet smooth, and of a deep emerald green. The flesh which is thick, is of a suffused salmon color, exceedingly sweet and delicious and very thick meated.

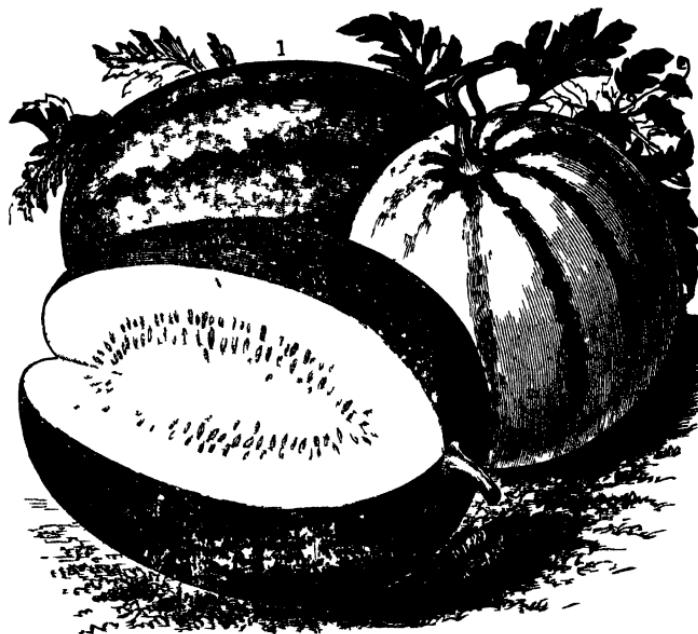
CALIFORNIAN NECTAR.—One of the most delicious flavoured Melons, of fair productiveness, medium early and of good size, often twelve pounds and over. The flesh is very thick, sweet and juicy.

NEW EARLY HACKENSACK.—This New Early is a selection or improvement almost equal in size to the Hackensack, and at least ten days earlier. The best as well as the earliest of all the netted melons. The melons weigh from six to ten pounds each, and are of delicious flavour.

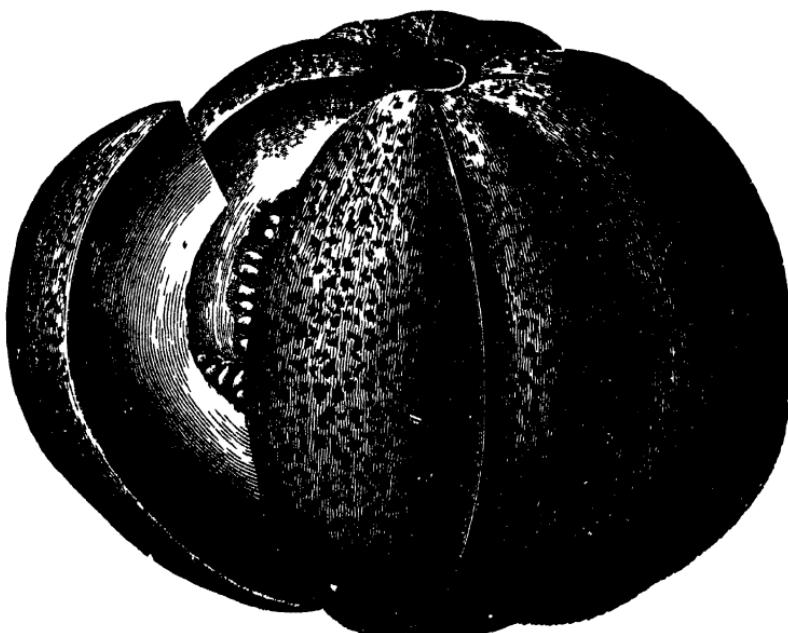
MONTREAL MARKET.—Excellent variety of the largest size; weighing over 20 lbs. In shape almost round, flattened at ends, deeply ribbed; skin green, very thick.

MILLER'S CREAM.—Most delicious. The flesh is a rich salmon color very thick, sweet and rich; rind very thin and finely netted. Vigorous grower, very productive.

SURPRISE.—This sort has a thin, cream colored skin and thick salmon colored flesh; is an early variety of delicious flavor.



WATER MELON



EARLY HACKENSACK MUSK MELON

(WATER MELON, *Cucurbita citrullus.*)
VERN.—TURBOOZA.

The culture of the Water Melon is so extensively carried on in almost every part of India and its treatment so well understood by natives generally, as scarcely to need mention here, but although our Aryan brethren may have nothing to learn with regard to its culture, they certainly require enlightenment on the proper selection of varieties, for not only are the sorts generally met with most inferior in point of size but what is of far greater importance the quality is of the poorest description as compared with the many splendid kinds now grown in America and the south of Europe. Wherever this fruit is introduced into a garden, imported seed should be insisted upon. In America an immense number of varieties are now grown, but the following selection embraces ample variety for all purposes.

CUBAN QUEEN.—This is a large variety, often weighing eighty pounds and upwards. The rind is marked with regular stripes of light and dark green. It is a very showy variety of fair quality.

FLORIDA FAVORITE.—Oblong in shape, growing to a very large size; rind dark with light green stripes; flesh light crimson, crisp and deliciously sweet; seeds small and of a creamy white color.

HENDERSON'S GREEN AND GOLD.—Of good size, from 25 to 45 lbs. in weight. The largest early variety, very productive and of delicious flavor. Rind very thin, being only from $\frac{1}{4}$ to $\frac{1}{2}$ inch in thickness. Independent of the delicious flavor, its rich golden color will make it most desirable as an ornament for the table, especially if its golden slices are arranged in contrast with the crimson of the older sorts.

HUNGARIAN HONEY.—This superb variety ripens early. The flesh is a very brilliant red color and of a very rich honey flavor; color of skin, medium dark green; uniformly of medium size.

KOLB'S GEM.—Largely grown. The fruit is nearly round; rind dark green somewhat marbled with lighter shades. Weight 25 to 50 lbs.

THE VOLGA.—A Russian variety, of perfect globe shape, small size and weighing 10 to 15 lbs. The flesh is bright crimson, and in crispness and delicacy of flavor is unsurpassed.

MUSHROOMS (*Agaricus Campestris.*)

The artificial culture of the Mushroom is but rarely attempted

in this country; this is probably owing to the fact that it is generally supposed to be attended with almost insuperable difficulties; such, however, is not really the case, for, provided we once get into the right groove, there is far less difficulty in producing a crop of this delicious esculent than there is in a colder climate.

There is no reason why every one who can obtain fresh stable manure should



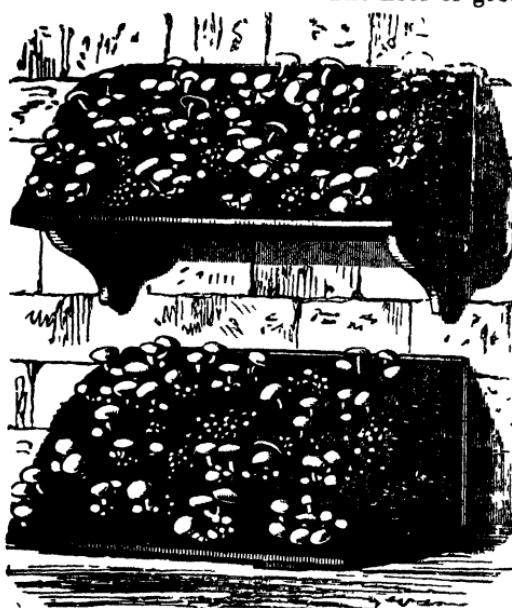
not have a supply of Mushrooms at any season of the year, except perhaps during the very hottest period of summer, when they are so often infested with maggots as to be unfit for use. Where short manure or droppings cannot be obtained in sufficient quantities, tree leaves, tan or long litter may be mixed together to form the foundation of the beds, with about 6 in. or 8 in. of horse droppings on the top for the spawn to work in; I have had very prolific beds made in this way. Given, good spawn and the requisite materials to produce a regular heat, and good Mushrooms may be produced in abundance either in a shed, or in the open air.

MATERIALS REQUIRED.—The principal and most essential material is horse droppings, which must be those of horses well fed on corn and hay, and collected as dry and free from straw as possible. Manure from horses under medicine, or which are eating grass, carrots, or vegetables, must be discarded. The use of such materials is often the cause of failures which cannot be accounted for at the time. It is imperative then that the manure be from horses fed on sound hard food. If spent or old tan, which has been kept for a lengthened period, can be procured it is recommended to use it in the proportion of one barrowful to four of manure. Tan is not necessary, but is valuable, as it helps to maintain the mild genial heat which mushrooms delight in.

PREPARATION OF MATERIALS.—In collecting the droppings they should be spread out thinly in a dry place and turned over frequently, until sufficient have been got together to form the bed. They should then be thrown into a heap and allowed to remain for a week, turning them over three or four times, or more if necessary, and as the outsides of this heap will naturally be drier than the middle, take care each time in turning to mix thoroughly, so that the whole mass may be brought to a uniform temperature. At the last turning it should be free from any rank or foul smell, or it is not in fit condition to be made into a bed. If tan is used it must be mixed with the manure at its last turning, taking care that the two are thoroughly incorporated. Great pains are necessary in the preparation of the materials and in putting them together, special care being taken that they don't get too wet. On the other hand should they become too dry they can easily be damped; but if too wet there is no remedy, and the manure is worthless for mushroom culture.

The next point is how and where to make the bed; Mushrooms will spring up anywhere where they can be kept dark, and where a moist temperature of 70° or 75° can be maintained; unless this can be done, I have no faith in the result. Few of us would care to incur the expense of erecting a special house for the purpose, nor is this really necessary; a cool damp godown, if possible with its doors or windows facing due north, will answer the purpose admirably.

FORMATION OF BEDS.—The floor or ground on which the bed is formed must be as nearly damp proof as possible, under any circumstances it is indispensable that the beds rest upon a thoroughly dry bottom. Beds may be of any form or size, but the best are those formed like a potato pit or hog, about three feet high and the same width at the base. Beds can also be made against a wall, though these give only one useful side, and in this case the width of the bed should be less than the height. In forming the beds, the



MUSHROOMS ON SHELVES.

materials, after being thoroughly mixed, must be beaten or trodden down as firmly as possible. A layer of dung is first laid regularly all over about 5 or 6 inches deep, then beaten down hard with a heavy wooden beater. The same with another layer, and another, till it gets from 12 or 18 inches deep. The latter depth is preferable, as it will retain heat longer than the former.

Barrels sawn in two, so that each part forms a tub, are well



MUSHROOMS IN TUBS.

simple shelves on which beds may be made and afterwards carried into godowns and places where the introduction of raw materials would be objectionable. To prevent heating too violently, holes should be

bored in the beds nine to twelve inches apart along the entire surface, reaching nearly to the bottom of the bed, a few stakes being inserted at intervals in order to test the heat at any time.

SPAWNING OF BEDS.—In whichever form beds are made, they must be left for a few days before spawning to see that fermentation is not renewed and too great heat engendered. When the temperature averages about 70° the bed may safely be spawned. A few days before the bed is spawned it is advisable to place the spawn in a warm moist temperature, as this ensures a safer and more rapid growth. Break the spawn up in pieces two to three inches square, and insert it in the bed about two inches deep and 6 to 8 inches apart. The bed should then be firmly trodden all over and a covering of about two inches of really good loamy soil spread evenly over the surface. Beat this firmly down, sprinkling it with tepid water during the operation. An even temperature averaging about 70° should now be maintained, and in no case should it be allowed to fall below 60° or to go higher than 80. Cover the bed with stable or straw litter to the depth of 4 to 6 inches, to draw the warmth to the surface and so maintain a steady, even temperature.

If the soil has been in good condition as to moisture, the covering of hay will maintain it, so that no watering is necessary until after the bed has yielded its first crop. But if otherwise, a good watering with tepid water should be given about ten days or a fortnight previous to the time that the mushrooms are expected. This should be particularly attended to, for if delayed too long, and the young mushrooms are breaking the ground, at that stage they are very impatient of too much moisture in the soil, and the first crop will be lost. A nice moist atmosphere should always be maintained while they are growing, which improves their size and quality, and likewise accelerates their growth. As soon as the bed shows signs of exhaustion a good watering will set it going again.

AFTER TREATMENT.—Under favourable circumstances, and if the work has been done well, the spawn will show activity in seven or eight days. At this stage the beds should be examined and any pieces of spawn that may have failed, replaced. This is easily seen by the absence of white filaments in the surrounding material. Mushrooms should begin to appear about six weeks after spawning if the temperature before mentioned (70°) be equally maintained, but if allowed to get cooler they may not show themselves in less than seven to nine weeks. Avoid watering unless absolutely necessary, as the beds may generally be kept sufficiently moist by damping the straw or litter placed on the beds. If they become too dry, tepid water must be applied gradually and very gently through a fine rose. In gathering the mushrooms, be careful to take them out by the roots, as when these are left in the bed they decay and seriously interfere with the successional crop.

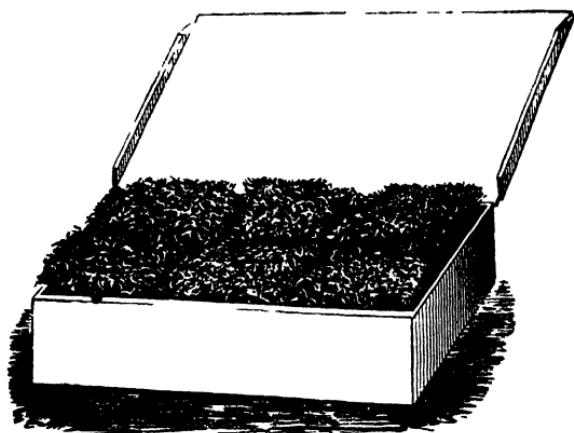
OUT-DOOR CULTURE.—Mushrooms may be successfully grown in dry sheltered positions out of doors. The same materials and preparations are necessary as for in-door culture. Select a suitable site well sheltered from penetrating winds where the soil is of a dry nature. Thorough drainage is essential, and the surface of the ground where the bed is to be formed, should be as dry as possible. The form of the beds should be that of a potato hog or pit as recommended above. The spawning must be carried out in the same way as that recommended for in-door culture.



MUSHROOMS, OUT-DOOR BEDS.

MUSHROOM SPAWN.

Mushrooms are readily propagated from spawn, of which there are two distinct forms or varieties English or what is frequently termed Milltrack Spawn is sold in cakes or bricks made of horse dung, cow dung, loam, and chopped hay well mixed together, and made into flat bricks, and to these cakes the Mycelium of the Mushroom is added, either from a pasture where Mushrooms are found in abundance, or more often from previously made spawn. After the cobweb-like Mycelium has spread through the compost in every direction, but before the more perfect threads have time to form, the whole is made into bricks or cakes and then dried ; and curiously enough the Mycelium thus treated retains its vitality for a long time, and soon develops itself when placed in a moist, firm compost or bed of horse droppings and soil, in a warm and humid atmosphere ; the flat cakes are about ten inches long and five wide, and vary from $1\frac{1}{2}$ to 2 inches in thickness.



FRENCH MUSHROOM SPAWN.

in inexperienced hands with greater certainty, though it is doubtful if its gives such a good out turn.

MUSTARD (*Sinapis alba*)

VERN.—RARE, SURSOO.

The ordinary variety of white mustard is so well known as to

need no description here, sowings may be made in the same manner and at the same seasons as the ordinary Garden Cress.



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MUSTARD, NEW CHINESE.

NASTURTIUM (*Nasturtium Officinale*)

The ordinary varieties of Nasturtium both climbers and dwarfs are extensively grown in many part of Europe. The flowers are principally used for garnishing salads. The flower buds and the seeds, while young and tender, are pickled in vinegar and used

French Mushroom spawn differs from the above in having the Mycelium grown or fixed in loose litter or straw with a proportion of horse droppings added ; when this can be procured fresh, it is to be preferred to the former, producing a crop in less time, and

MUSTARD, NEW CHINESE.—In this new variety, the leaves are of enormous size, frequently 12 to 14 inches in length. And it is not only highly esteemed as a salad, but is also a valuable vegetable when cooked the same as Spinach. Seed should be sown in October and the plants must be thinned out to a distance of 12 to 15 inches apart : in the Hills sow in March or April

the same as capers. For this purpose dwarf varieties are to be preferred as they flower more abundantly and do not require stakes or any other support.

OKRA OR GOMBO (*Hibiscus Esculentus*.)

VERN.—BINDEE, RAM TOROOEK, DHENROOS.

This vegetable is better known among Europeans as "Ladies Fingers"; however applicable this name may have been to the ordinary form generally grown in this country, it can scarcely be applied to some of the new large podded varieties recently introduced from America, in which country this plant has, during the past few years, received much attention, resulting in the introduction of several varieties that are decided improvements on the ordinary kind so well known in this country.



OKRA, WHITE VELVET.

Seed should be sown during April and May in drills 2 feet apart and when the plants are about six inches high, they should be thinned out to a distances of 18 inches in the rows, the seedlings removed may be planted out and will form a good successional crop to those left in the bed. This plant cannot be cultivated with success in the Hills at any elevation exceeding 4,000 to 5,000 feet. The following are the best of the new American varieties.

PERKIN'S MAMMOTH PODDED.—This variety is not only the most productive known, but bears enormous sized pods, and is earlier than any other; its average growth is three feet, and each plant produces generally from 20 to 30 pods which are of a beautiful green color and even when young are of mammoth size.

DWARF PROLIFIC OR DENSITY.—A very fine new variety, much dwarfer than the ordinary dwarf Okra and more productive. The long slender pods are tender, of fine quality and produced very early.

WHITE VELVET.—This is decidedly the best of all. It is very distinct in appearance, and unlike other varieties, the pods are not ridged, but are perfectly round, smooth, and of an attractive white velvet appearance, and of superior flavor and tenderness. The plants are comparatively dwarf and of compact branching growth; the pods are of large size and produced in great abundance.

ONION.—(*Allium cepa*).

VERN.—PEE AJ OR PEEYAJ.

The principal difficulty in the cultivation of the Onion in this country is to procure seed that will germinate. Even in Europe, when it is more than a year old, it will but rarely grow satisfactorily. It is hardly surprising therefore that we should be frequently disappointed in our attempts to produce a crop from imported seed. Acclimatised seed, however, germinate freely, and when a crop is grown to be drawn when young for salads, etc., it is preferable to use this, as there will then be no fear of a disappointment, provided fresh seed is procured.

The Onion is a very gross feeder, and requires deep cultivation; a light, rich, sandy soil suits it best; the ground should be trenched to a depth of at least two feet, adding at the same time a heavy dressing of manure. Sowings may be made early in October in drills nine inches apart.

If the seed be good, it can scarcely be sown too thinly, for all superfluous growth that has to be removed at thinning time, is so much loss to the main crop. After sowing, the drills are trodden in and the beds lightly raked over. As soon as the seedlings show themselves, a Dutch hoe is run between the rows, and repeated at intervals, to keep down weeds; when the plants are about 6 inches high the rows should be hand-weeded, and the plants thinned to

their proper distance apart, which must be regulated according to whether large specimens are required or only a full crop of medium-sized bulbs for ordinary use ; the latter is preferable, and in that case the plants may be left from 3 in. to 6 in. apart in the rows. When in full growth, a top-dressing of soot is highly beneficial. As soon as the plants are six inches high, they may be thinned out to a distance of six inches apart in the rows. They must be kept plentifully supplied with water, and frequent dressings of liquid manure will materially conduce to the production of a good crop.

The young plants removed from the seed bed should be drawn carefully without injuring the roots, and transplanted into other beds. If carefully managed, these will produce almost as good crops as those left in the seed bed. In planting out, however, it is necessary to notice that they are not put too deeply in the soil, otherwise this will prevent the proper formation of the bulb. As soon as they become ripe they should be pulled up and placed on mats to dry, fully exposed to the sun for a few days taking care to remove them inside at night. When they have become thoroughly dry, they should be carefully cleaned and stored in sand in a cool and dry place. Sow in March or April in the hills.

There are an immense number of varieties now grown in Europe ; many of these, however, in consequence of their taking a long season to attain maturity, are not adapted to this country. It is, therefore, advisable to select those sorts which are of a quick growth, such as "White Spanish" the Tripoli and in fact any of the Italian varieties.

BLOOD RED.—Medium size, strong flavour, excellent keeper.

BASSANO.—A very fine Italian variety of good quality and keeps well.

GIANT ZITTAU.—An excellent keeping variety, of handsome shape and clear yellow colour.

GIANT RED ZITTAU.—A new variety of the preceding, of the same size and shape but of a bright blood red colour.

DANVER'S YELLOW.—An excellent sort for general use ; good cropper, very fine and early.

GOLDEN QUEEN.—A splendid new variety, of good size and flavour, very hardy and an excellent keeper.

MAGNUM BONUM.—One of the best varieties in cultivation, very hardy, good cropper and will keep longer than any other.

SILVERSKIN.—The best variety for pickling, for this purpose they should be sown very thickly.

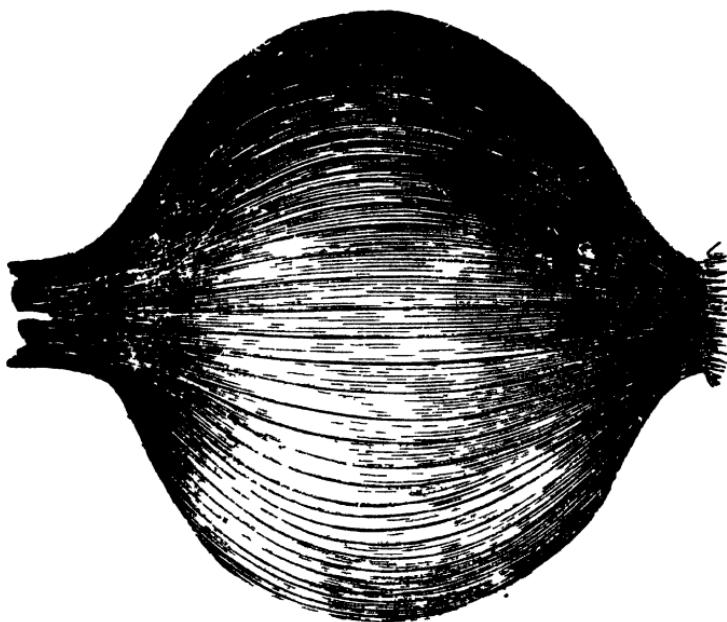
WHITE GLOBE.—A large globe-shaped onion ; firm, fine-grained of mild flavor ; keeps well. This is one of the handsomest onions grown, of beautiful shape, clear white skin.

WHITE SPANISH, PORTUGAL, OR READING.—Well known as a large and excellent variety, of pale straw colour, mild in flavour, and one of the best for general use.

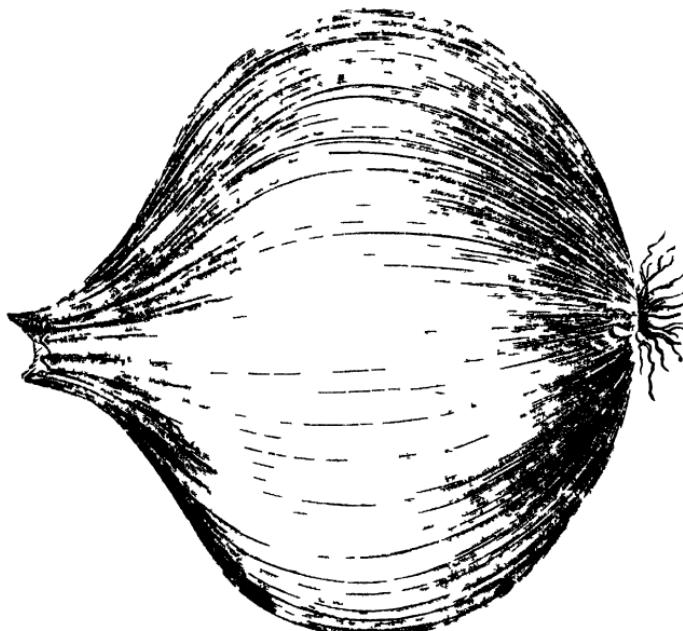
WHITE QUEEN.—A fine early silver-skinned variety, of beautiful form and rapid growth, and possessing fine keeping qualities.



ONION, NEW WHITE QUEEN



ONION, PORTUGESE DELICACY



ONION, SILVER BALL

NEW ITALIAN VARIETIES.

The following varieties are strongly recommended not only for the exceptional size to which some of them attain, but also for their quick growth, a point of great importance in this country where our growing season is so short.

PORTUGUESE DELICACY.—A splendid large globular variety, flesh pure white, flavour mild and delicious, this is one of the handsomest varieties in cultivation.

SILVER BALL OR GIANT WHITE ROCCA.—Of all the Italian Onions now in cultivation, none are more popular than the Giant Rocca. This variety is of the same fine quality and grows equally as large as the Red Rocca, which it resembles in every respect except that the skin is pure white.

GIANT RED GARGANUS, OR MAMMOTH POMPEII.—This variety was raised in Italy and sent out under the first name given above, but on arrival in America was re-named and sent out as the "Mammoth Pompeii." Bulbs of the enormous weight of 5 lbs. have been grown in America but the average weight, under good culture is from 2 to 4 lbs. each ; notwithstanding their gigantic size, they retain their perfect shape and fine quality. The skin is very thin and delicate in appearance, of a reddish brown colour, flesh pure white, fine grained and mild in flavour.

ONION GIANT WHITE GARGANUS OR MAMMOTH SILVER KING.—This variety has the same origin as the preceding, and its second name originated in America. If there is such a thing as a delicate flavored Onion, we have it in this variety. It is very rapid in growth attaining an enormous size, frequently measuring when fully grown, 5 to $7\frac{1}{2}$ inches in diameter and weighing from 2 to 4 lbs. each, of a beautiful silvery white colour.

LARGE RED ITALIAN TRIPOLI.—A very large-growing variety, of blood red color ; more flat in form than the Rocca, and of mild flavour.

LARGE WHITE ITALIAN TRIPOLI.—A very superior variety, of flat form and large size, with a beautiful silvery white skin, and of mild flavor.

GIANT ROCCA OF NAPLES.—A very fine large variety, globular shape, and light-brown skin, and of very mild flavour ; will frequently attain, under favorable circumstances, two pounds in weight.

RED VICTORIA ONION—*Of distinct oval-round shape*, weighing from $2\frac{1}{2}$ to $4\frac{1}{2}$ lbs. each, with capacity of still larger growth under extra cultivation. Skin very dark red, *almost blood red*, in color ; flesh white or very light rose colored : flavor very mild and sweet ; a good keeping variety. It grows best in loam, or heavy soil, which may even be stony and must be well worked ; properly cultivated this variety, uniformly larger in size than any Onions hitherto known, produces an enormous crop.

WHITE VICTORIA ONION.—Skin silver-white, but sometimes of a delicate light rose color ; flesh juicy, sweet and milky white. In other particulars this variety has the same qualities as the *Red Victoria* ; it generally grows equally as large, and is of the same distinct oval-round shape as shown in the illustration. It delights in frequent hoeings of the soil and watering in dry weather.

PARSLEY (*Petroselinum Sativum*)

VERN.—PETERGELEE,—RANDNEE.

This although a perennial, can only be grown successfully as an annual in this country. Sowings may be made in pans under shelter in August ; by the end of the rains these will have formed strong plants, and should then be planted out into beds of well manured soil at a distance of six inches apart. A second sowing may be made in the open ground in October ; this will not



PARSLEY, CERATIUM - FOLIUM L. VIVID

require to be transplanted, but the plants should be thinned out to the distance mentioned above. A slightly shaded situation suits it best; the seed will be found to germinate much more freely, if it is steeped in

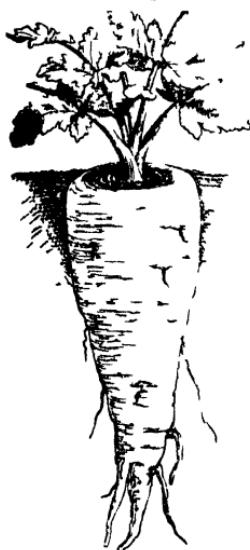
water for three or four hours and then well mixed with dry ashes or sand before sowing.

Sow in the Hills in April, where, if a bed is once well made, it will last for years.

THE PARSNIP (*Pastinaca sativa*)

VERN.—PASTINAC, ISOTIFLIA

This vegetable is but very rarely grown in Bengal, the principal difficulty in its cultivation seems to be to induce the seed to germinate, as when once the plants are above ground they require no more care than the Carrot. A mistake too frequently made by many is in sowing the seed too early before the soil is in a suitable state for it to germinate in. It is always advisable to delay sowing till the first week of November, when, if a light, rich, friable, soil is available, a good crop may generally be grown without difficulty, for it is more frequently owing to the seed rotting in the soil from an excess of moisture than from any actual defect in the seed that so many failures occur in the attempt.



PARSNIP, GUERNSEY



PARSNIP, ST. DENT.

to grow this vegetable. The seed may be sown broad-cast or in drills at a distance of nine inches apart, and as soon as the plants are four or five inches high, they should be thinned out to the same distance in the rows. They must be kept liberally supplied with water, and an occasional dressing of liquid manure will also be found beneficial. Sow in the Hills in March.

THE PEA (*Pisum Sativum.*)

VERN.—MUTTAR OR MÂTER.

The Pea will succeed wherever ordinary vegetables thrive,



PEA, AMERICAN WONDER.

but a calcareous soil suits it best; and when the soil is deficient in lime, it must be added to it in some form or other, particularly if it contains much vegetable matter or humus, as mostly all old garden soils do. The ground should be deeply trenched and otherwise rendered permeable to the roots, for

the Pea is a gross

feeder, and the deeper its roots are encouraged to go, the less likely is it to be attacked by mildew, for a deep and open soil affords the most constant supply of moisture to the roots, and dryness is the chief cause of mildew. Of course, deep trenching is not absolutely necessary, though advisable; but the ground should at least be deeply dug, and the Pea in such a case should never follow any other very exhausting crop, if good or even fair returns are expected. Farmyard manure, rotten stable litter, old hotbed material, rotten leaves, decomposed vegetable refuse from the rubbish-heap, and such like, are all excellent manures for the Pea, and perhaps safer and preferable to artificial manures, which are uncertain in their effects. Good crops have been produced by guano in some cases, and in others the results have not been so satisfactory, the tendency of such stimulants being to produce rank growth and little crop. Any of the above manures may be applied in a rank state, provided they are dug deeply into the ground some months previously to sowing the seed; and I should always recommend manure to be dug in with the single

spit in preference to trenching it and burying it out of reach for the time being ; but very rotten manure may be dug in along with the crop.

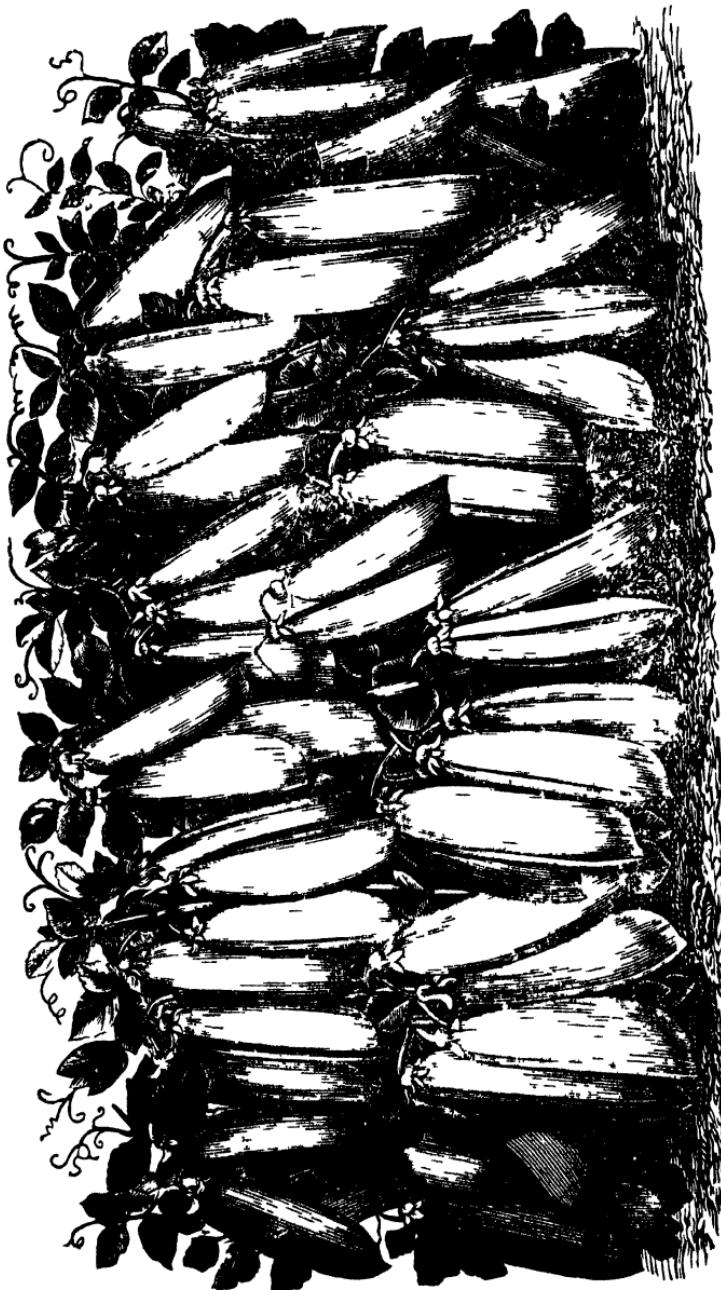
The first sowing may be made about the middle of September on raised beds, commencing with the dwarf early varieties, and, where space is available, this should be followed by successional sowings at intervals of a week or ten days up to the end of November. Before sowing, if the ground is very dry the seed should be steeped in water for three or four hours, and then allowed to dry for about the same time before being planted. The dwarf kinds may be sown in rows about eighteen inches apart, and the seeds about one inch apart, covering them with about an inch of soil.

The best distance apart at which to plant main or succession crops must, as in other cases, be governed by the varieties grown. If the kinds be tall, at least 6 ft. between the rows should be allowed, but dwarf kinds may be sown a little closer. Nothing is gained by overcrowding, as by so doing both light and air are, to some extent, excluded, causing the haulm to assume a feeble, weakly habit. Some sow Peas broadcast in the rows, others place each Pea separately in the drill, a good practice when time can be spared for such work, as they come up more regularly, and afterwards grow more evenly. If the plan of successional sowings be practised, the intervals between each must depend upon the varieties grown, as some, come into bearing much sooner than others. Many make it a rule to sow as soon as the produce of the previous sowing appears above ground, but this rule should not be made absolute, for, if the weather be favourable, one sowing should not be made so close on the heels of the other. If sorts be employed that do not naturally form a succession, sowings must be made at intervals of a fortnight or three weeks, according to circumstances.

A good dose of manure water given sometimes will greatly improve the crop. Watering, be it observed, should be done thoroughly ; far better to water half the crop at a time and do it well than only half do the whole. Pouring water close to the stems of the plants is a practice which is best avoided, as it sometimes causes them to rot. In very dry weather a sprinkle overhead in the evening will be found to be beneficial to the foliage, and also to assist the setting of the blooms.

CULTURE IN THE HILLS.

For early crops sow in March continuing at intervals of ten or fifteen days up to the end of May, it is useless sowing after that date, as unless the plants are well advanced before the rainy season sets in they generally become so infested with mildew as to be perfectly useless ; for an autumn



Brist's EARLY MORNING STAR PEA

commence sowing again from about August 15th to September 15th and if early varieties are selected they will be in full bearing during October and November. About October 15th to November 15th plant main crop and late varieties to stand the winter, a warm sheltered locality should, if possible, be selected for these—they will probably make but little progress during the winter, but on the first approach of spring will start into vigorous growth, and under liberal treatment should bear plentifully in March and April.

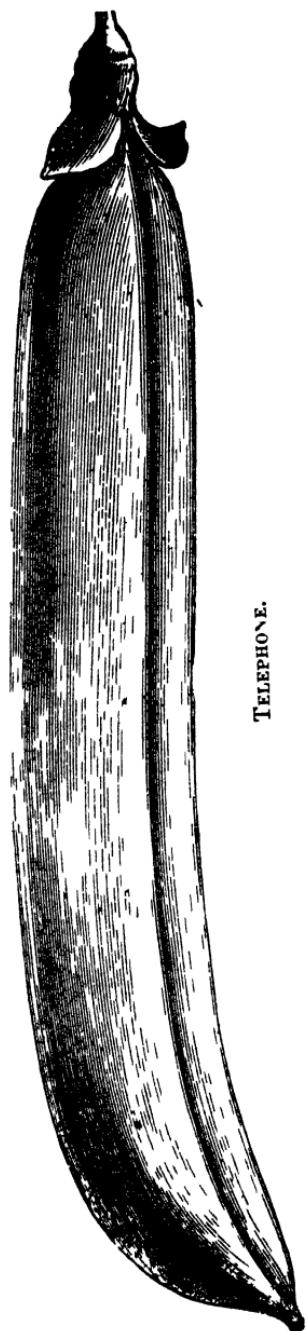
SELECTION OF VARIETIES.

I.—EARLY SORTS.

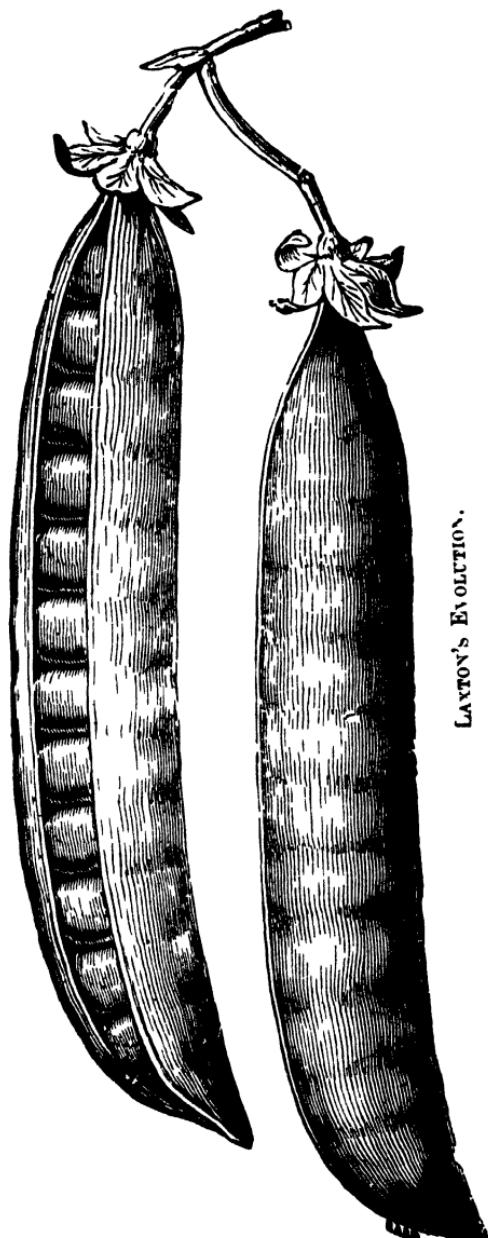
VARIETIES of Peas, like all kinds of produce for which there is a large demand, are continually increasing, so that to make a selection from catalogues has become almost a hopeless task. Starting with early kinds, except for the first few gatherings, the earliest section of Peas is scarcely worth growing when compared with the rich melting flavour of the Marrows that come in later; but as the aim of most growers is to get Peas as early as possible, a sowing is generally made of one or other of the small round kinds.

The best early Pea at present in cultivation is undoubtedly William the First; it is not quite so early as Morning Star, First Crop, or Ringleader, but its quality and productiveness compared with these varieties more than compensates for its being a day or two later. Still, where very early Peas are in request, it is well to grow one of these sorts, in order to have a picking as early as possible. Morning Star, Ringleader, and First Crop are the earliest, and no doubt possess certain advantages over the other varieties; American Wonder, Blue Peter, Multum in Parvo, First Crop Blue, Little Gem, Kentish Invicta, and Emerald Gem are all excellent early varieties, and are well spoken of by the gardening public; but if only one variety of early Pea be wanted, that should be William the First. It is one of the earliest, if not the earliest of Marrow type; it is of excellent flavour, and an abundant cropper; the next best are perhaps, American Wonder, Blue Peter or First Crop Blue.

As a dwarf-growing, free bearing, compact Pea for sowing in succession to the above, McLean's Gem is unsurpassed, for not only is it a most prolific bearer, but it is everything that can be desired when cooked. Were I only to grow one kind of Pea, this would be the one, as it has all the good qualities which a dwarf, early sort can possess, and from not being more than about 2 ft. high, a few twiggy sticks suffice for its support, a consideration in places where Pea sticks are difficult to obtain.



TELEPHONE.



LAXTON'S EVOLUTION.

II.—MAIN CROP VARIETIES.

Under this class we have such a large number of really choice varieties that it is difficult even for the most experienced to make a selection, where dwarf kinds are preferred, no mistake can possible be made in selecting such sorts as Dr. McLean, John Bull, Stratagem, Midsummer, Veitch's Perfection or Yorkshire Hero. Amongst the taller growing sorts Laxton's Evolution, Champion of England, Telegraph, Telephone, Superiority and Magnificent may always be relied upon, and from the newer varieties Dignity, Duke of Albany, Baroness and Sharp's Queen, I can recommend with confidence.

II.—VARIETIES OF LATE PEAS.

Although some new and valuable varieties have been lately added to collections of late Peas, I do not think that any of our well-tried standard kinds should be discarded to make way for them. Dwarf Peas, as a rule, are seldom sown for late crops, as they do not continue in bearing so long as the taller ones. My greatest favourite is Ne Plus Ultra, and when only one variety is required to be grown, that Pea should be selected. It is a tall grower, and requires to be well staked, but it amply repays that trouble. It is a good cropper, a continuous bearer, and, as regards flavour, unsurpassed. British Queen, Sander's Marrow, Emperor of the Marrows, Champion of England, and Victoria Marrow, rank among the best of old varieties, whilst Sutton's Giant Emerald Marrow, Prolific, Fillbasket, G. F. Wilson, and Laxton's Omega, are the best amongst newer kinds, and useful for earlier gatherings, but for the latest crops the former are decidedly the best.

Where room can be spared and stakes obtained, I would recommend every one to grow Ne Plus Ultra, a truly grand Pea and perfect in every respect. This, should be sown thinly, and, if possible, at intervals of 10 ft. apart, as then both sides of the rows get plenty of light, and heavy crops of large well-filled pods are the result. Besides the convenience of gathering and a great increase in the yield, raising Peas at wide distances apart has other advantages, such as affording suitable shade to Celery, Cauliflower, and Lettuce, that always succeed much better when so treated than when grown in any other position. As before observed, Peas require a deep, rich soil and in order to spare unnecessary labour, I make it a rule to sow them where Celery has been growing the year previous and *vice versa*. The advantages of this will be obvious at a glance, as the one prepares the ground for the other. To grow Celery well, the trenches must be heavily manured, of a portion of which the Peas get the benefit, and the deep digging necessary for its cultivation and in taking it up, is just what the after crop requires, as the roots can penetrate far down and be in a measure independent.

In the case of late, or, in fact, any of the Marrow Peas, plant them evenly over the drills from $1\frac{1}{2}$ in. to 2 in. apart, according to kinds, thick planting being ruinous to Peas, or, indeed, to any other crop. When dry weather sets in mulch with manure, if it can be had, 18 in. or 2 ft. wide on each side of the rows; if manure cannot be had, then use the best substitute available. Fresh loose earth spread over the surface to the thickness of 2 in. or 3 in., will often produce a better result than meagre waterings. All late Peas should have the pods picked carefully, without pulling or breaking down the stems, and should always be gathered before they get too old for use, as unless this is attended to they exhaust the plants unnecessarily, and shorten the time of bearing. Peas should be staked before the tendrils begin to form, so that they may have something to cling to, for if once allowed to lop over they never thrive so well after, even when placed again upright. There are various ways of arranging sticks to Peas, but the best way is to slope them at about an angle of 45° , and to let the sticks on each side slope the contrary way. The Peas are not so liable to be blown about, and there is a saving of staking, while instead of allowing the tops to meet, as is generally the case, leave an interval of 4 in. or 5 in. between, to insure plenty of room for the Peas to grow inside the sticks. Where a succession of late Peas must be kept up, the rule is to sow again as soon as the last sowing is well through the ground.

PEA NUT.—(*Arachis hypogaea*.)

VERN.—CHEENEF BADAM.

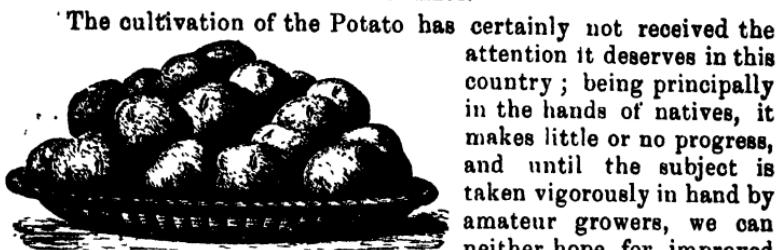
This plant is well known in almost every part of India and is

very popular amongst natives but is hardly admissible in our gardens, nor is this necessary as it is always procurable in every native bazaar at a very low price, one or two varieties said to be an improvement on the ordinary kind have been introduced from America, but so far as I could ascertain, after trying



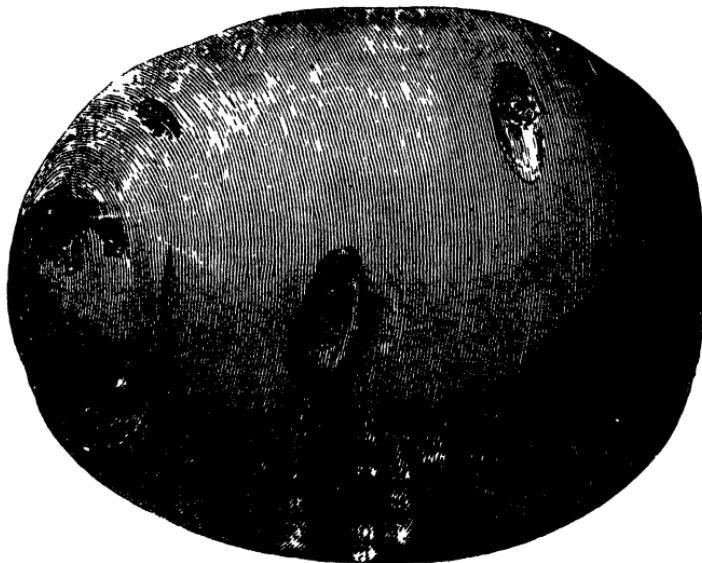
them side by side, the difference in quality or size was imperceptible.

THE POTATO.—(*Solanum Tuberosum*
VERN.—ALOO.



The cultivation of the Potato has certainly not received the attention it deserves in this country ; being principally in the hands of natives, it makes little or no progress, and until the subject is taken vigorously in hand by amateur growers, we can neither hope for improved varieties nor for a better system of cultivation. The aim of the cultivator should be not only to grow as heavy crops as possible, but also to produce the tubers of good quality. The nature of the soil as well as the treatment given materially affects the crop in both respects, and a suitable selection of varieties is of great importance. No esculent is more easily grown in a great variety of soils than is the Potato, but according to my experience a deep friable loam is the most suitable ; not soil that has previously been heavily manured and perhaps lightly cropped, but good fresh loam, of which a fresh enclosed piece of meadow land is a good type. This fresh soil will yield good crops for one or two seasons without manure, but after receiving a good dressing of manure, the crops, if well managed in other respects, would be enormous. Such soils in a favourable season are by good management made to produce from 12 to 15 tons of Potatoes per acre. Of course, private growers seldom have the advantages of a virgin soil, but heavy crops may be obtained from some old-established gardens. A soil very full of manure is quite unsuitable for Potato growing, and to obviate this difficulty, it is very advisable to dress it over with hot lime and to bastard trench. It may be advisable to explain for the benefit of those for whom these remarks are intended, that bastard trenching is breaking up the land two spits deep without bringing the bottom spit to the surface, it being in most instances much too poor and unworkable. The top spit of the wide trench is wheeled to the finishing point, the bottom spit is broken up, and on to this the next top spit is thrown, the shovellings of the latter being good fresh soil that oftentimes has not been touched by the spade for years, any manure that may be used, it is advisable to work in between the spits and not out of reach of the roots. Where it is impossible to trench, the ground should be deeply dug, and if too rich, may be brought into good condition by a dressing of hot lime only, and then taking off it a good crop of Brussels Sprouts, Broccoli or Cabbages. To be brief, a heavy crop of Potatoes of good quality can best be obtained from a comparatively poor soil heavily manured at or about the planting time.

Of manures, I prefer that obtained from the stable, to which artificial or concentrated manure, notably Guano, are very valuable adjuncts. The latter supplies much ammonia, of which the manure frequently used by gardeners is nearly destitute. The defect in most artificial manures is absence of humus, hence in dry seasons unless used in conjunction with solid manures, they are of but little value. The heaviest crop of Potatoes I have ever seen was taken from land manured at the rate of ten tons of manure and five cwt. of Guano to the acre. The condition of the seed Potatoes or sets materially affects the weight of the crop, and for this reason deserves great attention. Observant growers attach much importance to a change of seed, and the results produced are abundant evidence in support of their theory. Seed Potatoes should never be allowed to sprout in heaps, or they will be much weakened thereby; choose moderately strong sets sufficiently started to enable the operator to rub out all side shoots, the centre and strongest one only being retained. This is very important with Kidney Potatoes, the centre shoot being so much stronger than the side shoots. I do not attach much importance to the selection of handsome tubers, although some growers consider this the *sine qua non* of success. If rounds or varieties of the Snowflake type are scarce, by all means cut them into two or more sets according to their size, but the best results generally follow those planted whole, provided the central shoot only is allowed to grow. Potatoes that are very valuable and scarce may be propagated from cuttings, or they may



POTATO SNOWFLAKE.

be cut into as many sets as there are eyes, dipped in either slacked lime or sand, bedded in leaf or vegetable soil, and placed under glass till they have started and emitted roots. Water sparingly at the commencement, and transfer to the trenches before the roots have spread far.

The time of planting must depend entirely upon local circumstances. The soil cannot work too well, as the lighter the soil in contact with the tubers the better the quality of the crop, consequently the time of planting must be regulated by the state of the soil as well as the kind of weather experienced. We place the rows of Ashleafs and others of moderate growth 2 feet apart, and the sets 10 inches apart. The rows of strong-growing varieties are placed 3 feet apart, and the sets 1 foot apart in the rows. The Scotch Champions and Magnum Bonums on strong soils require still greater distances, 4 feet between the rows and 15 inches between the sets not being too much. The sets are dibbled in by many, but I think it a wrong practice, especially if the soil is heavy. As before stated, the soil about the sets should be well broken up, the better to enable the "runners" or Potato-producing roots to extend freely; but when a dibbler is used, unless the soil be light and open the reverse is the case. Another expeditious method is that of digging-in the sets, for by this practice the soil about them is well broken up, and the ground is not trampled on after planting. The sets are placed in the drills formed during the process of digging, and covered over with the next spit. Lines are used, and the rows placed the usual distances apart. I prefer planting in drills, whether on trenched or newly dug ground. These are drawn with a heavy hoe, and vary in depth according to the composition of the soil; if light and open they are 6 inches deep, if at all close much more shallow. Previous to planting, the ground is stirred to a good depth with a fork, giving a dressing of soot at the same time. When the sprouted sets are planted they are first covered with soil by the hand, and then covered over, forming slight ridges, between which we dig or loosen with a fork. When pushing through the ground they are again covered over, and again forked between, both operations being finally repeated when the growth is about 9 inches high.

The selection of varieties must depend upon the nature of the soil. New varieties should be tried, if only to be discarded, for it is a mistake to grow a great collection, however interesting it may be. The American varieties—such as the Early Rose, Alpha, Snowflake, and Bread fruit—are particularly good for light sand, but are comparatively worthless on heavy soils. Of the Ashleaf type Veitch's Improved and Mona's Pride, especially the latter, do well with me; and of early rounds a good variety of Dons and



PUMPKIN, LARGE CHEESE



JAPANESE PUMPKIN



MAMMOTH ETAMPES.



PUMPKIN, LARGE YELLOW.

French Shaws are the most profitable. The latter especially ought to be more grown in private gardens. On light soils Porter's Excelsior crops very heavily and is of good quality, and the Early Coldstream is also good. Of second earlies, I like Snowflake and Woodstock Kidney. Rector of Woodstock, although small, is a heavy cropping round variety of excellent quality. For the main crop I recommend Schoolmaster, Victoria Regents, and Scotch Champions—rounds; and of kidneys Prince Arthur, Covent Garden Perfection, and Magnum Bonum. I do not recommend anyone to plant either the latter or Scotch Champion too largely; but a breadth of one or both should be planted as a measure of precaution. It will, however, be a mistake to rely too exclusively on them, as should a dry season ensue, short crops will be the result, for the simple reason that they are very gross feeders, and unless they receive very liberal treatment in the way of deep cultivation and abundance of rain and manure, will fail; at least, such is my experience with them. Disease-resisting they undoubtedly are in a marked degree.

PUMPKIN.—*Cucurbita Pepo.*

VERN.—KUDDOO.

The many varieties of Pumpkin or Gourd generally grown in this country are of such inferior quality as scarcely to permit their being allowed a place in our gardens. Amongst the numerous American varieties that have been introduced during the past few years there are many of considerable merit and well deserving of more extended culture in this country, seed may be sown at any time from May to October; most of them are very vigorous growers and will require the support of a stout trellis or they may be planted so as to overrun outhouses or to act as a screen to hide any unsightly object in the garden. Where quality is desired the Japanese, Tennessee Sweet Potato, Quaker Pie, or Jonathan should be planted but if size only is aimed at Mammoth Etampes, Jumbo, Large Tours or Large Yellow should be selected, but it must be borne in mind that in point of quality these are scarcely superior to the ordinary native varieties. Large Cheese is probably the best keeping variety, keeping well for fully six months after it is ripe.

In the Hills up to an elevation of about 8,000 feet, every description of Pumpkin grows with wonderful vigour, setting its fruit freely and producing very fine specimens under the most ordinary treatment. Seeds should be sown from about the middle of April to the middle of June, the earlier sown crops however generally give the best results, as they have then ample time to complete their growth before the end of the rainy season.

RADISH.—(*Raphanus Sativus.*)

VERN.—MOOLEE, MULA, SUBUB.

The Radish requires a free, open soil, well enriched with manure. In fact, to grow them to perfection, it is nearly impossible to make the soil too rich. Sowings may be commenced early in September, and continued at intervals of about ten days up to January, though the produce of sowings made during October will invariably be found the best. The seed is best sown in drills about five inches apart, and after lightly covering with soil, the beds should be well beaten down. This insures the roots forming of a good shape. As soon as the plants are large enough, they should be thinned out to a distance of four inches apart in the rows. If the soil is fairly rich, and the plants are kept liberally supplied with water, they should be ready for drawing in about three to five weeks from the time of sowing. Care must also be taken to keep the soil well stirred about the plants. There are now a large number of varieties, but these differ more in form and colour than in quality, for, when well grown under the same conditions, but little difference can be discerned in their flavour. There are also two indigenous varieties which grow to an enormous size, and are much eaten by the natives. These are, however, so coarse and inferior in quality to the English varieties, that they are not worth cultivating in the garden.

During the past few years a large number of new varieties have been introduced in France and America, several of these are great improvements on the ordinary kinds generally grown. Amongst these may be mentioned Knickerbocker or Chartier a fine long kind, and Rosy Gem, Ne Plus Ultra and Champion belonging to the Turnip-rooted section.

RADISH—ROUND OR TURNIP.

LARGE WHITE GLOBE.—A very large, round, Turnip Radish. Of beautiful form, pure white skin and flesh which is very crisp and brittle. It grows quickly to a large size, and withstands heat.



GOLDEN GLOBE, OR GOLDEN YELLOW SUMMER RADISH.—This has proved a most valuable acquisition. It is more perfectly round in shape, and color brighter than the old Yellow Turnip Radish. Is of very fine quality and extra rapid growth, being fit for use in from four to six weeks after sowing.

NE PLUS ULTRA.—A splendid new variety of last season's introduction, of very delicate flavour, and brilliant colour, the earliest of all varieties.

SCARLET WHITE-TIPPED.—An excellent variety of fine quality; very early.



RADISH, KNICKERBOCKER.



RED ROCKET.



WOOD'S EARLY FRAME.



RED.—An excellent variety for general use, crisp and of mild flavour.

VIOLET TURNIP, WHITE TIPPED.—This is desirable as an early sort, being a rapid grower and of good quality. The upper portion is a deep violet color, the lower portion a good clear white. Like all so-called "white tipped" sorts, it is better pulled young.

WHITE.—Flesh very solid, and remains long in use.

ROSY GEM.—A very fine early scarlet variety, roots tipped with white, matures in from 15 to 18 days from the time of sowing, very handsome and when used young of very delicate flavour but does not remain long in good condition.

RADISH.—LONG VARIETIES.

NEW CHINESE.—A grand new variety attaining a large size and remaining fit for use a long time, flesh pure white, very tender, equal in flavour to the finest small variety.

WHITE STRASBURG.—This is a very desirable early variety, of an oblong tapering shape, and of pure white color; is exceedingly crisp and tender; it forms its roots very quickly, and stands the heat remarkably well; it is a very popular variety in Paris and is rapidly becoming so with us.

BECK'S SUPERB SCARLET SHORT-TOP.—An excellent sort for general use.

EARLY LONG SCARLET SHORT-TOP.—Very early, tender, crisp and fine flavoured, the roots averaging half an inch in diameter at the top and tapering throughout their length of four or five inches.

LONG WHITE VIENNA—(Lady's Finger.) This is the finest Long White Radish in cultivation. Most beautiful in shape; skin and flesh are pure snow white, crisp and of rapid growth.

WOOD'S EARLY FRAME.—A long, red radish, not quite so long as the Long Scarlet, and with smaller top; it is quite ten days earlier than the Long Scarlet Radish.

BLACK PARIS WINTER.—The hardiest variety, will stand greater extremes of temperature than any other variety.

GIANT STUTTGART.—This fine variety is very early and of quick growth, both flesh and skin are pure snowy white. It withstands the severest heat and grows to an immense size. Notwithstanding its large size, the quality is always the finest, firm, brittle and not pithy, so that they can be pulled for use at any stage.

AMERICAN KNICKERBOCKER.—This is one of those good things that although only recently introduced, has already received many different names, such as "Chartiers," "Shepherd," &c., &c. The roots grow to a large size about two thirds of the length being of a crimson-rose colour, shading off lighter, till at the bottom, they become pure white. They are of quick growth, very tender and remain of good quality for table use for a long time, it is ready for use nearly as early as the long scarlet and keeps crisp and tender for two months, not becoming stringy when large, as do most other radishes.

RADISH—OLIVE SHAPED.

FRENCH BREAKFAST.—A variety of quick growth, but does not remain long in use. Colour scarlet, tipped with white.

SCARLET.—An excellent variety, of quick growth and mild flavour.

VIOLET OLIVE SHAPED, WHITE TIPPED.—A variety similar to the preceding, differing, only in colour.

WHITE OLIVE SHAPE.—Very delicate in flavour, but should be used young.



RHUBARB.—(*Rheum Hybridum*)

The cultivation of Rhubarb in the plains is rarely attended

with successful results, seed sown in October germinates freely, and if treated liberally will produce small stalks six to nine inches in length by February or March, but on the first approach of hot weather the plants invariably succumb. In the Hills it can be grown with



RHUBARB PLANT.

great success; seed may be sown in April or May and as soon as the seedlings have made 5 or 6 leaves they should be planted out at a distance of 1 foot apart in richly manured ground; as soon as the leaves die down in Autumn, the plants may be planted in their permanent quarters, beds should be prepared by trenching to a depth of at least two feet, add a foot of good old Manure, mixing the same thoroughly with the soil, put out the plants at a distance of three feet apart each way, keeping the crown of the plant on a level with the top of the soil, cover the surface of the beds with six inches of manure, and allow them to remain till February by which time they will show signs of growth, as soon as the first leaves make their appearance, give a good dressing of liquid manure which should be repeated at intervals of ten or fifteen days.

RHUBARB STALKS READY
FOR USE.

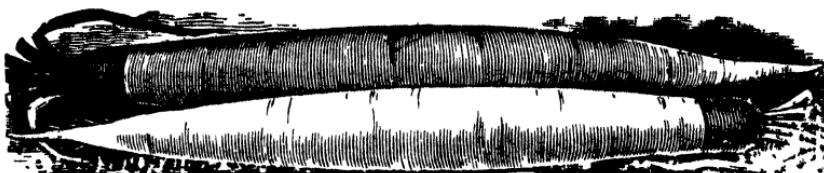
The following are the most popular English varieties.

ST. MARTIN'S.—A new Scotch variety. It is immensely productive, one of the earliest, and has a rich spicy flavour very similar to the gooseberry when used for pies or tarts.

LINNAEUS.—Early, large and tender.

VICTORIA.—Very large, later than Linnaeus.

PRINCE ALBERT.—Very large and prolific, the best for general use.



SALSIFY, SANDWICH ISLAND MAMMOTH.

SALSIFY, OR VEGETABLE OYSTER.—(*Tragopogon porrifolius*.)

Very generally known as the Oyster Plant ; the roots are boiled like Carrots, or Parsnips, or half boiled and grated fine, made into small flat balls, dipped in a batter, and fried like oysters, of which their flavor greatly partakes.

The Oyster Plant succeeds best in light, well enriched, mellow soil, which previous to sowing the seeds should be stirred to a depth of eighteen inches. Sow early, in drills fifteen inches apart ; cover the seeds with fine soil, an inch and a half in depth, and when the plants are strong enough, thin out to six inches apart. In the Hills sow in March and April. During the past few years much attention has been given to the improvement of Salsify both in Europe and America, and we now have several improved varieties ; amongst these, the best are Buist's Mammoth, and Sandwich Island Mammoth, the latter especially is a very fine variety and should be grown in every garden in preference to the old French variety, the roots of this frequently attain a length of 15 inches with a diameter of 1 to 1½ inches without being in the least bit stringy in texture, the flavor also is, when well grown, more luscious than that of the older forms generally grown.

SCORZONERA —(*Scorzonera Hispanica*.)

This very much resembles the preceding having the same habit of growth and requiring the same treatment, produces larger roots, and by some is preferred to Salsify.

SEA KALE —(*Crambe maritima*.)

This Vegetable cannot be grown with any degree of success in the plains although in the Hills under the same treatment as practised in Europe, there is no difficulty in obtaining a crop of first class quality, that is provided the seed can be induced to germinate, the best plan is to sow in pans or boxes in any warm position and as soon as the plants are about 4 inches high, should be put out in a bed of good rich soil, great care must be taken to keep the plants constantly watered. They will not be fit to eat for use until the third year, and after that they will continue to bear for eight or ten years.



SPINACH, PRICKLY OR WINTER.



SPINACH, SAVOY LEAVED.



SPINACH, LONG STANDING ROUND.

SHALLOT—(*Allium Ascalonicum*).

VERN.—GUNDHAM.



SHALLOT.

This vegetable is rarely met with in this country. It is probably the most delicate in flavour of all the members of the Onion family and is much esteemed in many parts of Europe. It is propagated in the same way as Garlic, and requires precisely the same treatment.

SPINACH.—(*Spinacea Oleracea*).

VERN.—PALUK.

Although there are several distinct varieties of Spinach which in Europe are cultivated at different seasons, in this country they must all be grown at the same time; and, as their produce so closely resembles each other, it is hardly necessary to grow more than one of them. Preference should be given to the round-seeded variety, being quicker in growth and more tender than the other.

Sowing may be commenced in October in drills about twelve inches apart, in any good garden soil which has been previously well manured. Sowings should be made at short intervals up to December, to keep up a continuous supply. The plants must be kept well supplied with water, and an occasional dose of liquid manure will also have a beneficial effect.

Sowings in the Hills may be made from March to November, but for late crops only the prickly variety should be used.

VARIETIES.

MONSTROUS VIROFLAY.—An extra large round-leaved variety, extensively grown for the Paris market.

LONG STANDING ROUND.—A great improvement on the old round Spinach, remaining for a much longer period before running to seed.

SAVOY LEAVED.—This variety differs from the preceding in having its leaves curled like a Savoy Cabbage.

PRICKLY OR WINTER.—The hardiest variety, will stand great extremes of temperature.

NEW ZEALAND SPINACH.—(*Tetragonia expansa*.) Very useful to supply the place of the ordinary Spinach during the hottest months of the year or in dry, arid localities where the ordinary spinach does badly. The seed is sown where the plants are to stand, in May, and the plants will continue to yield a supply of good leaves of excellent quality during the entire summer, requiring hardly any attention.



SQUASH.—(*Cucurbita Melopepo*).

VERN.—SUPHURA KOOMRA.

During the past few years vast improvements have been made in this vegetable by American Growers, not only in point of size but also in quality. In varieties there are Summer, Autumn, Winter, thus filling the season all the year round. However, in this country, all the various classes will have to be grown at the same season, the best time being from April to June in both the Hills and plains. Almost any soil is suitable for the Squash although for a good crop of fine grained and well flavoured fruit, a light sandy loam is to be preferred.

Among summer varieties, I can recommend Summer Crook-neck and Bush-scalloped ; the first a limited runner, the other of dwarf, erect habit.

The Crook-neck is the better Squash in all respects for the table. The fruit of these summer Squashes is too well known to need description. Both are used while young and tender, as when old, the skin becomes hard and shell-like. They also become watery, coarse, and unpalatable. The Crook-neck



GIANT SUMMER CROOKNECK SQUASH

may be planted in hills 6 ft. apart, and the Bush-scalloped 4 ft. each way, in large hills, with a heaping half bushel of manure to each hill in garden culture. Among the autumn and winter varieties, the Boston Marrow is a good one ; the plant is moderately vigorous, growing from 10 ft. to 12 ft. in length ; fruit not large, ovoid, pointed at the ends ; stem fleshy and large, somewhat contracted where it joins the fruit ; skin thin, easily bruised ; creamy yellow at maturity, changing to red later ; flesh, rich, salmon yellow, quite dry, fine-grained, and remarkably sweet. In favourable situations it will be sufficiently grown for use by August, and will, under favourable circumstances, keep till March. The American Turban appears to be a sort of sub-variety of the original Turban, and in some respects is an improvement thereon. Compared with the original, the plant is somewhat hardier, and a more abundant bearer, a better keeper and quite as rich and

delicate. The Hubbard is vigorous; fruit irregularly oval, from 8 in. to 10 in. long, and from 7 in. to 8 in. in diameter, fair specimens weighing from 7 lb. to 9 lb., outer shell hard and thick, covered with small protuberances; colour variable, clay-blue or deep olive-green; long exposure to sun causes the exposed side to assume a brownish cast; flesh rich salmon-yellow, and thick, fine-grained, sweet, dry and of the best flavour.

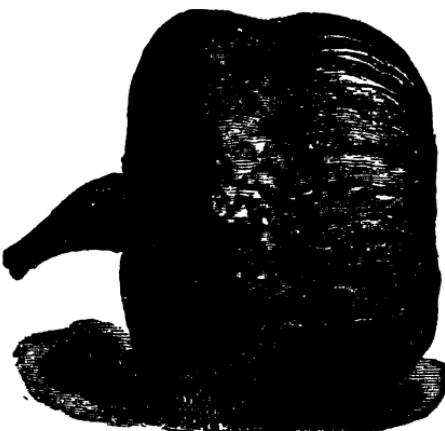
This Squash, I consider, has no superior in excellence for cooking purposes. The Yokohama runs to the length of 12 ft. or more; fruit roundish, much flattened at the ends, strongly ribbed; size from 8 in. to 10 in. in largest diameter; skin warty, yellow or dull orange at maturity; flesh orange-yellow, fine-grained, dry, and sweet. Will keep till March. The Canada Crookneck is somewhat similar in habit to the common Crookneck, but has smaller foliage, and is less luxuriant in growth; size small, seldom exceeding 6 lb. in weight; skin moderately thin, easily pierced by the nail; colour, when mature, cream-yellow; age causes it to assume a deeper or darker colour; flesh salmon-red, very close grained, dry, sweet, and fine-flavoured; best of the Crooknecks; plant very hardy.

Where size is a desideratum Mammoth Chili should be grown, this under ordinary cultivation frequently attains a weight of over 100 lb.; it is, however, rather coarse in quality. Henderson's Golden Custard is a fine new variety that grows well anywhere, other varieties that can be recommended are Essex Hybrid, The Warren, Bay State, Fordhook and Pikes Peak, all of these are very hardy, of good quality and if properly ripened, may be kept for a very long period, I had fruit of most of these varieties, last season which were cut early in November and were kept over till March and April without any signs of deterioration.

THE TOMATO.—(*Lycopersicum Esculentum*).

VERN.—BILAETEE BEGOON.

Probably there is no part of the world with a climate better adapted to the cultivation of the Tomato than that of Bengal from October to March, and yet it is a plant that has been much neglected here. Only two kinds are seen in our bazaars, namely, the Small Red and Large Red varieties, which, in this age of vast improvements, should long ago have been consigned to oblivion,



SQUASH, ESSEX HYBRID.

especially when we might have in the place such fruit as The Mikado, Shah, Trophy, Acme, Carter's Greengage or Nisbett's Victoria. The cultivation of the Tomato here is extremely simple. Seed should be sown in Bengal at the end of August in a seed-bed sheltered from heavy rain and in the North West and Punjab fully a month earlier. The plants will be ready for putting out early in October; they should be planted in well-manured soil in rows three feet apart, with the same distance between the plants. When practicable, a bamboo trellis should be placed along each row, about three feet high, to which the plants may be trained. In England it is customary to pinch out the point of each shoot to induce them to set their fruit. Here, however, this is quite unnecessary, and they require no care beyond an occasional watering and tying up.

Some of the small fruited varieties such as King Humbert, Pear Shaped, Nisbett's Victoria and Early Red may be sown just before the commencement of the rains, these should be planted on a well raised bed and the plants should be put fully four feet apart, and supported by stout stakes or bamboo trellises, thus treated, a good circulation of air amongst the plants is insured, thereby preventing the possibility of their damping off which they are very liable to do if too crowded or allowed to trail on the ground, to prevent a too luxuriant growth, the tips of the lateral shoots should be kept well pinched back, this will induce the fruit to set freely, the crop from this sowing should begin to ripen early in October and if properly treated will continue fruiting until the larger varieties sown after the rains commence bearing. Tomatoes may be sown in the Hills from March to May the earlier sowing will, however, require the protection of a Glass House or Frame, and where these are not available, it is advisable to delay sowing till the middle of April. The number of varieties introduced during the past few years probably exceeds that of almost any other vegetable, of course amongst these there are many so closely resembling each other as to be scarcely distinguishable; the following selection, however, I believe comprise the best American and English varieties.

BUIST'S BEAUTY—A new variety introduced a few years since, which has proved to be a great acquisition. Its important features are solidity, large size, perfection of shape, desirable color (which is brilliant scarlet), evenness of ripening without crack or wrinkle, freeness of core and its few seeds.

EARLY OPTIMUS.—Resembles *Livingstone's favorite* in general appearance but is more uniform in size, and is very early. The large, handsome tomatoes are borne in clusters of three to five; of bright crimson-scarlet color.

EARLY SMOOTH RED.—Is one of the oldest varieties, quite early, of medium size, of apple-shape and bright scarlet color.



NISBETT'S VICTORIA.



Tomato, Dwarf Champion.



Tomato, Buist's Beauty.



GOLDEN QUEEN.—The tomatoes are bright Golden yellow, of large size, handsome, round shape, very smooth, free from ridges and ripen up evenly and very productive. The fruits are of good substance and excellent for slicing, the handsome yellow slices making a beautiful contrast in a dish with red tomatoes.

GOLDEN TROPHY.—A splendid variety in every respect resembling the Trophy, except that the fruit is of a beautiful golden colour.

GREENGAGE.—Rich citron-coloured semi-transparent fruit. It is particularly early and prolific, and the deliciously piquant flavour, described as "a beautiful blending of the Apple and Tomato," has secured for it the most universal admiration.

KING HUMBERT.—Smooth, glossy, scarlet fruit, of the size and shape of a large plum, unsurpassed for productiveness and one of the earliest sorts grown.

LARGE RED.—Fruit large, bright red; deeply sutured, exceedingly productive.

LIVINGSTONE'S FAVOURITE—An American variety of bright red colour and smooth skin.

MAYFLOWER—Very early. The shape is globular, slightly flattened, perfectly smooth. Of a glossy red color, and ripens perfectly and evenly close up to the stem.

PERFECTION.—The fruit is larger in size than the Acmé, and a little smaller than the Paragon; color blood red; it is as early as the Canada Victor (one of the first to ripen), almost round in shape, perfectly smooth and very solid, of the best quality, enormously productive, bearing all through the season.

Peach Bloom.—Splendid new American variety, extremely ornamental, the ripe fruit exactly resembling in shape and colour a Peach.

PARAGON.—One of the finest Tomatoes in cultivation, the fruit is handsome, of perfect globular form, very smooth in outline, of large size when well grown, and a great cropper.

PRESIDENT GARFIELD.—A variety of extraordinary size, bearing fruit weighing from 2 to 3 lbs. each; very luxuriant and prolific.

PEAR SHAPED.—A very ornamental variety; fruits small, produced in bunches.

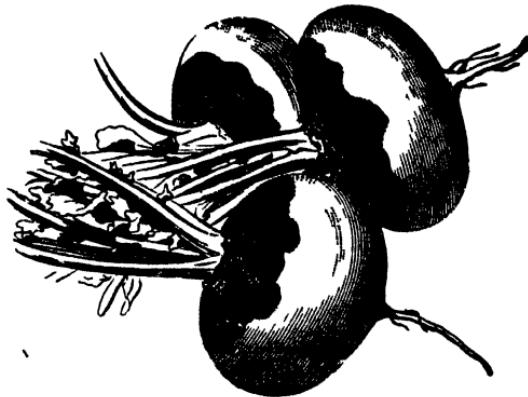
RED Currant or GRAPE.—A very ornamental variety, the fruit growing in clusters closely resembling large bunches of red Currants.

SELECTED TROPHY.—The popularity of the Trophy is equal to that of any other variety, and will always be regarded with great favour by all growers. This variety is noted for its solidity and beauty.

THE MIKADO.—The Mikado differs from all other Tomatoes in its immense size (the illustration being not more than one half the average size), and the Tomatoes are produced in immense clusters, are perfectly solid, generally smooth, but sometimes irregular. The color is purplish red, like that of the Acmé, while the variety has all the solidity that characterizes the Trophy. It is not unusual for single fruits of this variety to weigh from 1 to 1½ lb. each. The foliage of the Mikado Tomato alone shows the distinctiveness of the variety, for it is whole or entire, while in all other varieties the leaves are cut or serrated.

THE SHAH.—Identical with the Mikado in every respect, except in color (which is a dark, waxy yellow), having the same distinct foliage, the same enormous size, solidity and productiveness.

DWARF CHAMPION.—An entirely new and distinct variety, the stems being thick, stiff and short jointed, it is actually self-supporting when laden with fruit: no other variety possesses this valuable characteristic. The foliage is a very dark green in color, thick and corrugated, and differing in form from that of any other sort. It is unsurpassed in productiveness, and its close, upright growth enables it to be planted nearer together than any other variety. The fruit in form and color closely resembles the well-known Acmé, and is always smooth and symmetrical in form.



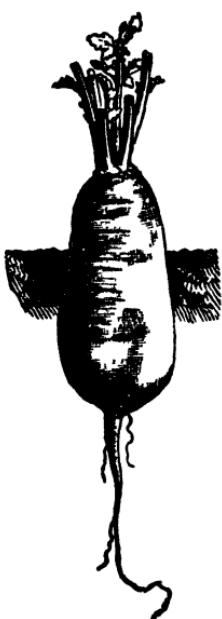
TURNIPS.



TURNIP.—(*Brassica Rapa.*)

VERN.—SHALGAM OR SELGUM.

A rich, deep, mellow soil, with a fair amount of moisture, is the most favorable for the Turnip, although any good soil, well dug and manured, will grow them well. Sowings should be commenced in September and continued at intervals of a few days up to the end of November. They should be sown in drills about twelve inches apart, and as soon as the plants are large enough, should be thinned out to the same distance in the rows. The plants must be kept free from weeds, and the soil frequently loosened around them. They must also be kept freely supplied with water and occasionally drenched with liquid manure.



JERSEY NAVET.

As a rule, large Turnips are not required; therefore they should be sown just soon enough to insure roots about the size of one's fist. It is a good plan to make sowings at an interval of a fortnight from each other. Turnips are in all cases best in drills about 1 in. deep and 12 or 14 in. apart. Late crops should be sown rather wider apart than earlier ones, in order that light and air may circulate freely among the foliage and about the roots, otherwise the leaves get watery and incapable of resisting severe dry weather. As soon as the plants have made leaves 1 in. in width, the hoe must be at work amongst them, cutting up weeds and stirring up the ground. They should be thinned to about 12 in. from each other in the rows. In dry weather give them a good soaking or two of water, and hoe between the rows at least once a week. I ought to have stated that it is not essential that the ground should be prepared just previous to sowing the seed, it being an advantage to have it prepared some time beforehand, when it is not required for other purposes. In all gardens of limited dimensions every inch of ground is an object, and the moment one crop is gathered the ground should be turned up and planted with another. Manure freely and dig deeply, and the soil will be capable of bringing to perfection two, three or even four crops in one season. For early sowings of Turnips, the best are Early American Stone Strapleaf, which is very early and good; Early White Dutch, a sort that becomes quickly fit for use; Early White Stone; and Early Snowball. For the main crop there is nothing better than Red Globe; it is an excellent

variety, and it has the good property of remaining a long time fit for use. For late use, Orange Jelly or Golden Ball and Chirk Castle are fine hardy sorts ; the flesh of the latter is beautifully white, though the outside is nearly black, and the flavour is good ; but the flesh of the former is yellow, therefore, in the eyes of some objectionable ; sowings may be made in the Hills from March to September.

VARIETIES.

CHIRK CASTLE, BLACK STONE.—Black skin, flesh pure white, sweet and juicy, hardy, a useful sort for late use.

EARLY SNOW-WHITE GLOBE.—This is one of the most beautiful formed varieties known, of pure snow-white color, and almost as round as a ball ; a very desirable and productive early market variety ; is far superior to the White Globe for a general crop.

EARLY RED AMERICAN STONE STRAP LEAF.—Very early, flesh white and firm, keeps well.

EARLY SNOWBALL.—One of the best whites, flesh sweet and tender ; very select, of beautiful shape.

EARLY WHITE STONE OR SIX WEEKS.—Early, excellent, keeps well.

YELLOW ALTRINGHAM.—The best of all the yellow varieties.

EARLY PURPLE-TOP MUNICH.—A distinct and very early variety.

EXTRA EARLY MILAN STRAP-LEAF.—The earliest variety in cultivation, of fine shape and excellent quality. First Class Certificate, Royal Horticultural Society.

EXTRA EARLY PARIS MARKET.—An oblong, much esteemed, early white French variety.

GOLDEN BALL.—Rapid grower, excellent flavor, globe shaped, and of a beautiful, bright yellow color, a good keeper, and has no superior for table use.

JERSEY NAVET.—Oblong shape, white flesh, sweet flavour, good for late sowing.

LARGE RED TOP GLOBE.—This is a variety of recent introduction, of large size, globe form ; is of rapid growth, and very productive ; it is of the same character and habit as the Red Top Flat, differing only in its shape and leaves ; can be sown either broadcast or in drills ; flesh pure white, with a red or purple top ; is very desirable, and is destined to become very popular.

LARGE GREEN TOP STONE.—A very choice variety of quick growth, fine flavour, strongly recommended.

LATE AUVERGNE.—A splendid French variety producing fine well shaped roots quite 6 inches in diameter and 3 to 4 inches deep, flesh solid and of fine flavour, I recommend this for late crop.

MOORE'S WARWICK.—An improved variety of Green-top stone.

FLAT WHITE DUTCH.—This is a vast improvement on the ordinary Dutch variety, bulbs smooth and free from cracks, very delicate flavour and the earliest of all varieties.

FLAT RED DUTCH.—Resembling the preceding in every respect except in colour.

VEITCH'S RED GLOBE.—A useful sort for late sowing, remains fit for use a long time, handsome shape, very hardy.

WHITE EGG.—Its shape is nearly ovoid : flesh very firm and fine grained, thin and perfectly smooth, skin and flesh are of snowy whiteness. Its flavour is of the very best, mild and sweet.

YELLOW DUTCH.—This variety in appearance exactly resembles the White Dutch except that the flesh is of a bright golden yellow.

Vegetable Marrows.



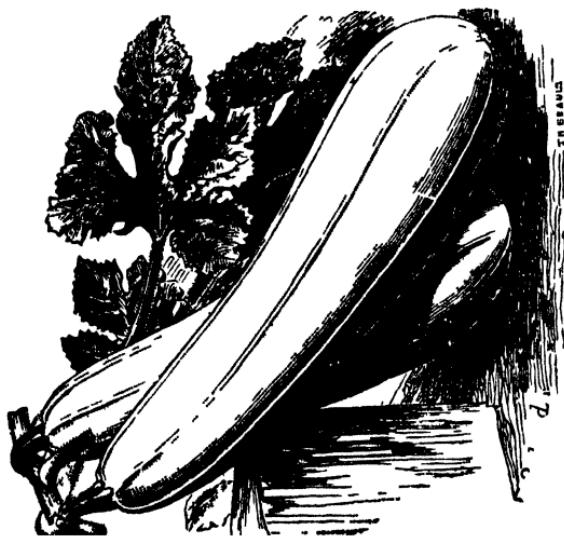
KING'S ACRE CREAM.



MOORE'S CREAM.



LONG WHITE RIBBED.



LONG WHITE RIBBED.

YELLOW MALTA.—A very handsome yellow variety, of excellent quality.

YELLOW MONTMAGNY.—A very handsome variety, outer colour dark yellow below ground, and of a dark violet red in the portion above ground, roots above 6 inches in diameter, and 3 or more deep, flesh yellow, firm, tender and of good quality. The very striking contrast between the yellow and the red parts of the roots gives it a very particular and pleasing appearance, which, together with its earliness and the superior quality of the flesh, are powerful recommendations in its favour.

SWEDISH TURNIPS.

These are becoming very popular in this country and in many gardens now take the place of Kohl Rabi, to which they are decidedly superior in point of flavour. Culture the same as the preceding.

GOLDEN APPLE.—A very fine variety, extra early, bulbs small and of exquisite flavour.

SCHMERFIELD.—A highly recommended Continental variety, the best for general crop.

WHITE GLOBE.—The best white fleshed Swede, very early and of good flavour.

LAING'S SELECTED.—A very fine variety, with rich golden flesh, the best of all.

VEGETABLE MARROWS (*Cucurbita Pepo.*)

The same culture as recommended for Squashes should be adopted, they are all easily grown in any part of India, provided they can be kept well supplied with moisture through the whole period of their growth. When the plants begin to run, they should be pegged out, and the strongest shoots occasionally stopped, so as to fill up all vacant spaces. It is an excellent plan to mulch the ground occupied by the Marrows with long littery manure—or anything that will keep the earth cool and moist—which treatment will save labour and materially benefit the crop. In dry weather copious waterings, with occasional supplies of liquid manure, will be very serviceable to the plants; they will add much to their productiveness, and discourage the attack of mildew. But there will be less necessity for this, if the ground can be heavily mulched. The Long White Vegetable Marrow is the best and most profitable kind to grow. When used as a vegetable it is best cut before it gets too large. Later on in the season two or three may be left for preserving for use, but the large ones rob the plants more than the same weight of small ones do; therefore they should not be allowed to attain a large size till the plants are very strong and well able to support them. In the Hills sow in April or May.

HIBBERD'S PROLIFIC.—Small well shaped fruit, of excellent flavour; very early and prolific.

KING'S ACRE CREAM.—A distinct new variety, recommended for its fine flavour.

CUSTARD.—A free bearing sort, of fine flavour.

MOORE'S CREAM.—A splendid variety, one of the best for general use.

LONG WHITE RIBBED.—A very large and prolific variety.

ITALIAN STRIPED.—A very fine new class, good flavour and very prolific.



YAMS.

YAM.—(*Dioscorea Batatas.*)

VERN.—CHOOPREE ALOO.

There appear to be several distinct varieties of Yams grown in various parts of India differing more in the shape of their tubers than in flavour or any other good quality. The tubers should be planted in March or April in ground that has been richly manured and trenched to a depth of about two feet, being rampant Climbers they should be grown where they can have some tree to run up or be supported by stakes or trellises. The crop will be ready for lifting by the end of November.

Sweet, Pot and Medicinal Herbs.

No Garden is complete without a few Herbs for Culinary or Medicinal purposes, and care should be taken to harvest them properly. This should be done on a dry day just before they come into full bloom, then dried quickly and packed closely, entirely excluded from the air.

ANGELICA.—(*Archangelica Officinalis*).

A perennial, but can only be grown as an annual in the plains; sow seed in October in drills 12 inches apart.

ANISE.—(*Pimpinella Anisum*).

An annual, in appearance much resembling celery, but with more finely divided foliage. The seed is principally used in the manufacture of liqueurs, and is also employed in Italy for flavouring bread.

BASIL.—(*Ocimum Basilicum*).

A native of this country, an annual of very easy culture, in fact when once sown, it generally reproduces itself yearly from self-sown seed.



BASIL.



BALM.

BALM.—(*Melissa Officinalis*).

A plant growing about 18 inches high. The leaves exhaling a very agreeable aromatic odour, especially when bruised, much used for seasoning especially in the South of Europe. It must be treated as an annual in the plains, but in the Hills will last for years and may be increased by dividing the clumps in winter.



BORAGE.

BORAGE.—(*Borage Officinalis*).

Much used in the manufacture of Claret Cup, an annual of easy culture, producing pretty bright blue flowers, and worth growing for these alone.

DILL.—(*Anethum Graveolens*).

An annual, frequently attaining 2 to 2½ feet in height, should be sown in the place where the plants are to remain.

HOREHOUND.—(*Marrubium Vulgare*)

In the Hills, this favorite plant of our ancestors is easily grown but it is useless to attempt its cultivation in the plains.



SWEET MARJORAM.

MARJORAM.—
(*Origanum Marjorana*).

An annual of very rapid growth, sow in October in the place where the plants are to remain.

ROSEMARY.—
(*Rosmarina Officinalis*.)

Requires the same treatment as Marjoram.

SAGE —(*Salvia Officinalis*)

This can only be grown as an annual in this country, and then with but a moderate amount of success.

The seed should be sown in pans or boxes in October, and kept in a cool, sheltered place till they are ready to be put out. They should then be transplanted into a bed of light, rich soil, a shady situation being selected for them; the plants will then continue growing freely till April, when, as the heat becomes more intense, the plants will gradually dwindle off, and those that survive this trying ordeal invariably succumb to the first heavy rains. If grown in pots, a few plants may occasionally be kept through the year, but with extreme difficulty. The

plant known as Bengal Sage (*Meriandra bengalensis*) is entirely distinct from the preceding, especially in flavour, although it is used as a substitute for it; this is propagated by division of the roots.



ANDRE

ROSEMARY.

LAVENDER.—
(*Lavendula Spica*).

Can easily be raised from seed sown at the end of the rains and with care, plants may be kept over for years but can rarely if ever be induced to flower. In the Hills, however, it blooms freely but must be protected during the rainy season as the plants are very sensitive of damp, especially when young.



LAVENDER.



SAGE.

is principally employed in the manufacture of liqueurs.

THYME (*Thymus serpyllum*.)

This, like the Sage, can only be successfully cultivated as an annual in this country. Plants are easily raised from seed sown in October, and as soon as they are large enough should be planted out in a bed of light, rich soil in a shady situation.

WORMWOOD.—
(*Artemesia Absinthium*).

Requires the same treatment as the preceding. The leaves are sometimes used for seasoning, but it

Part iii.

The Flower Garden.

FLOWERS," Bacon says, "are the thoughts of angels." Could the simile be more apt? Of music it has been said that "he who is not moved with concord of sweet sounde, is fit for treasons, stratagems and spoils." The same sentiments might be expressed in regard to the person who has no love for flowers, and that, too, with much more truth. It has doubtless fallen to the lot of more than one of my readers, some time during life, to have met at least one person who did not care or like to hear music,—whose soul was above being moved with "concord of sweet sounds;" but I defy any one to cite a single instance of coming in contact with any person who did not love flowers, or, at least, care for and admire them. True, they may not have been, as one may term it, an universal admirer of flowers; but still there is no person who has not his or her favorite flower; a flower which to them is emblematic of some peculiar quality they most admire; and I can safely aver that the ground-work of our strong affection and love for flowers is based upon this very apparent resemblance. It can be nothing but these floral representative qualities, that has created such universal admiration and love for them.

There is no action, thought or sentiment peculiar to human nature that has not its representative character in our floral universe. In what a high degree can our passions be represented! The lover succumbing to "all nature's sweet song" offers, upon the altar of love, flowers; and presents them to the mistress of his affection as fit attributes of his love, thus employing

flowers to represent the divine principle in man. The poet, in stanzas, enthusiastically chants the peculiar qualities of some favorite flower ; perchance it may be a Rose, a Camellia, a Forget-me-not, a Violet, or that flower of flowers, the Passion Flower, the several parts of which have been compared to the instruments of our Saviour's Passion. Every nation has its representative flower, if space permitted, I could cite each *seriatim*.

Flowers play an important part in our affairs of life ; and not only are they used as offerings to the living, but also as tributes to the dead. The flower most used for the dead is the tuberose, the aroma of which seems to be impregnated with pure angelic thoughts ; to such an extent is the tuberose now used in tributes to the dead, that to some its very perfume is unbearable, simply for this reason. But, on the other hand, to many, its aromatic odour is laden with the fragrance of affection.

With the English, both at home and abroad, the cultivation of flowers is every year increasing ; more thought, care, and attention is bestowed upon our pets, than at any former period in the world's history, and yet, the same as with most objects for which we possess any strong affection or liking, they are frequently ruined by our ignorance of the treatment they should receive. Some treat their flowers with an utter disregard for their good or their comfort ; it is true in most cases it is more inadvertent than wanton ; still it is none the less censurable. It requires but little observation to discover what is most beneficial to their growth and well-being. If one has a bird, he is apt to note any unnatural appearance or action that may occur, as exhibited in drooping plumage or in the cessation of its song, and resource is directly had to restore the bird to its normal condition. Now we can, in most instances, as readily and with as much truth, discover what ails our plants, and should deal with and treat them accordingly ; they exhibit in as high a degree their peculiar ailments as our birds. Then why not bestow that minute attention upon them ? Persons who rear plants, should study them and their wants, no matter how little they watch their peculiar exhibitions of health or sickness, the good accruing therefrom will in the end be discernible in the appearance and health of their plants. As it is requisite that we feed our birds at stated times, so it is essential for the well-being of our plants that they be watered and attended to regularly. There is no very great line of difference between plants and birds, both move and have their being in somewhat the same degree. Though, to some unversed in the peculiar mechanism of plants, there may appear nothing but what is caused by some freak of nature, yet if they will take the time and trouble to study the matter ever so little, they will discover that their germination, growth, &c., is in accordance with law and order ; and as the nature of a child depends to a great extent upon the care, atten-

tion and training it receives, so that of a plant is as much dependent upon its training and cultivation, to allow of its perfecting its growth in an orderly manner. The *Pharmaceutical Journal* in a recent article says, that "there is much to reconcile students to the study of Botany. It is the study of some of the most beautiful objects in nature, which, although in the ordinary sense mute, possess an eloquence of their own, and never fail to appeal to the hearts of those who are willing to hold converse with them. They are organised beings like ourselves, and of all created beings they are, perhaps, those which offer the greatest facilities for deep searching investigation into the mysterious development of special organisms, springing either from an ingrafted type or from a minute spark of vitality which may have lain dormant for years in an apparently inactive seed. There are some hundreds of thousands of forms of vegetation proceeding from such obscure sources, each having distinct and definite characters of its own which it is capable of further propagating and thus maintaining a life everlasting. The root, the stem, the branches, the leaves, the flowers, the fruits, the seed—consider the arrangement of all these parts, how extremely elaborate and sometimes fantastic they are. Such arrangements are apparently infinite, but they are all subject to a law of nature, namely that of symmetry, which is one of the elements of beauty. Among the inducements to pursue the examination and study of the elementary structure and arrangements of parts in the vegetable kingdom is this, that we have tangible objects to deal with here, which can be brought within the cognizance of the senses. The knowledge we thus acquire is of a definite and definable nature. There is nothing speculative about it. It partakes not of the abstract, but of the concrete character."

If so much can be said in favor of the study of botany, how many more attractive qualities may be claimed on behalf of horticulture, for with the former we deal mainly with dried subjects or fully developed specimens only, but with the latter we are able to see all the various phases of plant life from infancy to maturity.

It is quite common for people to manifest eostatic delight at the sight of a few beautiful flowers, and to exclaim,

" Day stars ! that ope your eyes with man, to twinkle
 From rainbow galaxies of earth's creation,
 And dew-drops on her lonely altar sprinkle,
 As a supreme libation."

Yet it should be remembered, when one sees beautiful flowers, that somebody has spent anxious care and patience, working in harmony with Dame Nature, to start the tiny germs, to train the tender stems, to develop the buds and to unfold the many-tinted petals. It is well enough to feel the soul kindling into supernal rapture at sight of a fine display of roses or pansies and their fair

sisters, and to contemplate these charming beauties of nature as things of life, as living and breathing existences, and to soliloquize in poetic numbers :

“ Your voiceless lips, O flowers, are living preachers,
Each cup a pulpit, and each leaf a book,
Supplying to our fancy numerous teachers,
From every lonely nook.”

But let us not forget that every little rose bush, every little bed of pansies, every bit of floral beauty, has cost much of thought and labor by way of spading, putting in the store of plant food, keeping the weeds subdued, and helping each plant to battle successfully with the hordes of enemies that are ever ready to sap the vital fluid, when every root, tender stem and delicate leaf is trying to live and grow.

Many admirers of flowers, who never thought but that they have attained their wonderful development with as little cost and care as the dandelions that will grow in spite of ordinary efforts to kill them, during an attack of indigestion, or when sick of the world and tired of society, will break out in poetic effusions like this :

“ Were I alone, in distant lands remaining,
Far from all voice of teachers and divines,
My soul would find in flowers of Heaven's ordaining.
Books, churches, sermons, shrines.”

Many people, when they see the beautiful flowers that others have produced by unremitting care and thorough cultivation, are so filled with enthusiasm about raising roses or something else with their own hands, that they purchase expensive seeds, and costly bulbs, and high-priced roses, and scratch little places here and there in the lawn, and then pronouncing their own part well done, wait for nature to supplement their perfunctory efforts by evolving as charming flowers as those which are produced by their careful and industrious neighbours.

What is the result? Why, early in the growing season, before the seeds of most flowers have germinated, troublesome weeds spring up and choke the tender stems before one is large enough to be discovered by the naked eye. Then the dealers are denounced for selling worthless seeds. The few that, perchance survive, give an unsatisfactory growth of stems and blossoms, for the simple reason that the soil was not properly prepared and weeds were not eradicated. Strong and healthy rose bushes are frequently taken from the rich ground of the florist and transplanted to soil so poor that weeds even will make only a sickly growth therein. Such a practice is like taking a cow that has always been well fed and requiring her to subsist on straw alone. Yet many intelligent people cannot understand why their efforts to cultivate flowers

should terminate in such discouraging failures. How can rose bushes be expected to grow luxuriantly and blossom profusely, when hungry weeds on every side are robbing the roots of the small amount of plant-food that exists in the soil?

The successful management of flowers will always depend on thorough cultivation of the soil, on judicious pruning and timely destruction of insect enemies. If any one will be faithful at all proper times in the foregoing particulars, he will never be disheartened by failure.

Most of us cultivate too many plants; collection rather than selection is our aim; but then the difficulty is to know which to choose where all are beautiful. "My husband always has twice as many plants as he has room for," said a friend to me not long ago. "Ah, ah!" laughed the culprit, "I never can refuse a good thing, and you know we like, at any rate, to keep up with our neighbours." A very common, but nevertheless mistaken, notion is this of keeping abreast of our neighbours by cramming our garden with twice as many plants as it is capable of well containing. Much more praiseworthy is the spirit of rivalry when devoted to the culture of a few really choice plants, and much greater the pleasure they afford than a crowded assemblage of starvelings, however choice they may be.

SINGLE v. DOUBLE FLOWERS.—Is not the present prevalent fancy for single flowers of plants that produce double ones less a protest against the change produced in the structure of the flower by florists, and rather a sort of floral sentiment that for the moment holds sway? In taste for flowers, and many other things we are held in a sort of fashionable chain. Let the excited fancy take flight after brilliant bedding displays, then the popular fancy follows. So also does it in the case of carpet bedding; then it swerves off to a dance after hardy plants, and then from double to single flowers, and so on. Probably we shall be told that this indicates, not an eccentricity of mind, that is proverbial amongst the masses, but rather a reversion from feverish fancies back to a healthy state of mind; but all who watch the waves of fancy which flow through the world will have to admit that none have stability, and another will soon succeed the previous one, obliterating that and all its impressions. The present taste for gawky single flowers of certain kinds is retrogressive. It naturally conducts back to the garment of Fig leaves and all its very primitive associations. Does any sane person prefer the Dog Rose to a La France, a Devoniensis, or a Marechal Niel?—a single Peony to a double one, or single Stocks, Carnations, Asters, Balsams, Marigolds, ay, or scores of similar things, to double ones? Single Dahlias and single Pyrethrums are re-introduced as protests against the inevitable doubling of those flowers, but what are

they more than coloured Ox-eye Daisies!—big, staring yellow eyes that are coarse and monotonous, surrounded by single rows of thin loose petals. These serve very well to reproduce their kind, but of real floral beauties they have little.

THE CULTIVATION OF ANNUALS.

Evanescing as most of the annuals are, especially many of those generally cultivated in the open border, still when we consider the variety of species now in cultivation and how extremely effective they are when well managed, and how easy of cultivation, the wonder is that they are not more extensively cultivated than they are. I do not mean that other plants should be discarded, but they might be much more generally employed to supply unavoidable deficiencies. Instead of long reaches of naked shrubbery borders and meagre looking beds, such as one often sees, a really good show of bloom may be created, and that too with a comparatively small amount of labour. Let us take for instance Asters—what a variety of form, colour, and habit of growth do we not obtain among them. We know that there is a prevailing idea among amateurs that this beautiful family is only amenable to pot culture in this country. Such, however, is far from being the case, for they may be either ribboned out in distinct shades of colour, or they may be massed or dotted amongst shrubberies; in fact in whatever way they may be used they will thrive vigorously, and as regards brilliancy they have few equals. Now here is a plant of which a good supply may be obtained with a relatively small amount of labour. No fostering care during the rainy season is required in the case of this class of plants; operations need not be commenced until the most trying time is passed, and then all that is necessary is a suitable position for raising the seed, and afterwards a piece of well-prepared soil in the most sheltered spot that can be found on which to plant them out with a suitable mat covering to protect them in case of heavy rains. With one season's experience, the amount of seed to be sown and the room required will be accurately ascertained. The seed should be sown in pans about the first week in October, and as soon as the young plants are fairly up they should be gradually inured to the air in order that they may become hardy and be kept dwarf and stocky. By the time they have made three or four leaves they will be in a suitable condition for transplanting; prick them out in the beds of previously prepared soil already mentioned, from 4 in. to 6 in. apart, here they may remain until required for use. It is highly important that the soil in which they are pricked out should have been thoroughly pulverised and fairly enriched, a sprinkling of soot worked into it will also be found beneficial. Many consider it necessary to prick the seedlings into pans a second time or pot them off singly; this method however causes a vast amount of

after-labour in the way of watering, &c., and cannot be practised on a large scale. By the plan just described labour is economized and the results are in every way more satisfactory for the following reasons :—The plants having a more extensive root run, develop much better, and when taken up with a good ball of fibre they thrive better than when turned out of a pot. Then again if there be a pressure of work, they may be thinned out and the rest left until there is time to attend to them ; some too may remain permanently to be potted when full grown if required for decoration, or to fill up blanks that will sometimes occur later in the season. The above treatment will apply with but slight modifications to many other of the principal kinds of Annuals, such as Balsams, Stocks, Phlox Drummondi, and I have also grown Pansies successfully by the same method.

There are of course many kinds of Annuals which do not require even the labour and trouble just described, such as Candytuft, Calendula, Larkspurs, Mignonette, &c., all of which may be sown where the plants are to remain and flower. In fact with the enormous variety of Annuals now in cultivation, a garden may be kept gay the whole season through, almost entirely without the aid of any other plants. In order to effect this, a special study must be made of the times of sowing, &c., so as to keep up a constant succession. I have known gardens in which a blaze of bloom was kept up through the entire year by means of Annuals which were sown and grown in pots expressly for that purpose ; they were plunged in the soil when nearly in bloom, and the stock being kept up, the beds were always in perfection. The labour certainly was great, but the result was most satisfactory, the beds being always gay and always varying. I cite this merely as an instance of what may be done with Annuals, and my object in recommending some of the principal kinds for more general cultivation, is to enable all to have a gay garden in season and to help where there is a large space to fill and but limited means to fill it. There are, of course, many other showy subjects which may with but a slight amount of care and management be made very useful plants, which instead of being merely seen as single specimens, should be massed in order to obtain a good effect.

The many beautiful varieties of Annuals available for the decoration of our gardens are worthy of a much more extensive growth and a better cultural treatment than they generally receive in this country, and when well grown will produce flowers of a size and brilliancy that will surprise many who are only accustomed to the weedy half-starved representatives so frequently seen in our gardens. Although Annuals will thrive fairly well in almost any soil or situation, some little preparation of the ground is necessary to grow them to perfection, and the first consideration

is to reduce the surface to a fine and even tilth, and if the soil is poor, working in a liberal quantity of well-decayed manure. For a general display, perhaps, the best time for sowing is about the middle of October, and for a later succession, early in November. Regarding this, however, it is impossible to lay down any fixed rules, much depends not only on the season, but also the locality; for instance, Larkspur and Nemophilas in the North-West Provinces germinate freely if sown immediately after the cessation of the rains, but in Lower Bengal they can rarely be induced to do so before the middle of November, that is after the cold season has fairly set in. Nothing is gained by being too early, and frequently much is lost. An American writer on this subject says:—"Wait a little longer, is a safe maxim to guide amateur gardeners. The seedsman is often blamed for selling *un-vital* seed when the fault has been the 'previousness' of the planter. The grave uncertainties incidental to the germination of seeds at all seasons, are increased ten-fold under such conditions. A delay of a week may make all the difference between success and failure. Do not risk your time and labour by hasty seeding, or if you are tempted to sow at an unseasonable period, do not blame the seedsman for selling seeds that will not grow."

THE SOWING OF SEEDS.

The manner or mode of sowing seeds is perhaps of more importance than the time. The three great errors which the uninitiated are liable to fall into are—sowing too early, too deeply, and too thickly. Many seeds, especially small ones, require to be sown very shallow, or in other words to have little or no covering. But that is no reason why they should be cast upon the surface and exposed to light and air, for though there are a few seeds that will grow on the surface fully exposed, the majority, however small, require some amount of covering. That covering should vary with the size of the seeds and should be at the least as thick as the diameter of the seeds covered, and also sufficient to protect them from light and air. This is no easy matter sometimes, when some small seeds, such for instance as *Lobelia speciosa*, are sown under glass. The sun soon dries the surface covering, and unless water be applied through a very fine rose, the fresh water is apt to wash off the covering soil and expose the bare seeds to the air. A good deal of this risk would be prevented were all seeds placed in the dark until they vegetated, at least all small seeds. Light is of no use, if not absolutely injurious, and seeds would often far sooner germinate were they placed in darkness until they began to grow. Of course with the first signs of life they must be moved into the light and receive watering and other attentions needed by plants. More seeds, however, are probably killed by sowing or covering too deeply than too thinly. It is no uncommon thing, especially among

the inexperienced, to cover small seeds with a $\frac{1}{4}$ in. or even $\frac{1}{2}$ in. of soil. Thousands so deeply covered, perish. The germs either never come to life at all or are quite unable to cope with such a huge mass or weight of covering earth. Thick sowing is also to be reprobated. From the way in which valuable seeds are huddled together and thrown broadcast into heaps, one would think that they were the most worthless things in the world and land the most costly. There cannot be a greater fault or extravagance than over-crowding seeds. It undermines the constitution of plants at starting, and it is long before they outgrow the evil effects of such treatment. Each seed should have room to grow without injuring its neighbour. Of course seed of small plants may be sown much more thickly than those of larger ones, but relatively they ought not to be sown thicker. Each plant should have sufficient space to develop its cotyledons (seed leaves) and one leaf before it is thinned or pricked out.

After sowing, the cultivation of Annuals raised in the open ground is extremely simple. An early and vigorous thinning out of the clumps or patches being nearly all that is necessary to ensure an abundance of fine plants with a profusion of handsome flowers. Various methods are adopted in sowing, but perhaps the simplest and best plan for garden decoration is to sow in shallow furrows in circles of from twelve to eighteen inches in diameter, or in rows or drills, the distance apart to be regulated according to the height of the plants when fully grown. When this is done in dry weather, an excellent plan is to fill the drills with water and allow it to settle before sowing, carefully covering the seeds with the soil removed by the operation and pressing down firmly with a trowel or a spade. Such large seeds as Nasturtiums, Lupins and Sweet Peas may be covered to the depth of an inch, *Convolvulus Major* not quite so deep; smaller seeds, such as Mignonette, &c., require but a slight covering, whilst very small seeds should be thinly scattered on the surface and gently raked in. Annuals may also be sown broadcast in mixture in beds or patches in waste places, shrubberies, &c., and have a very pleasing effect. The most useful soil for raising plants from seeds in pots is composed of about equal parts of good rich loam, leaf mould and well-decayed manure, thoroughly incorporated with a sufficiency of coarse sand to render the whole fairly porous. In filling in pots, pans, &c., with soil, it is of the first importance, after providing ample drainage, that the soil should be pressed down firmly before sowing the seeds, which will have the effect of providing a much more even moisture and certainty of germination than can be had by sowing in a loose and porous surface. Sow the seeds thinly, distributing as evenly as you can, and cover as lightly as possible with a sprinkling of fine soil, and after submitting them to a slight pressure, give them a gentle watering

and place in a shady position, covering them either with mats, canvas, or any similar material till they have germinated. I know that this practice is opposed to the ideas of many experienced gardeners, who will not be convinced that light is in no way essential to induce germination, but has, on the contrary, a retarding effect; such is, however, undoubtedly the case. Mr. H. Cannell, who is probably the most successful raiser of Florists' Flowers in Europe, says :

" Sow your seeds in the usual way, only cover up and keep in total darkness until they begin to peep above the soil, then gently and gradually expose them to light. All this is so feasible that every sensible person will at once and for ever adopt it, and the success of all good seed will follow and become a lasting practice and benefit. For years past excellent treatises have been written, practical men have adopted shading their seed-pans with paper, and others with a glass vessel of water, various coloured glass, &c., all of which but slightly approach this system, and why it has not become a general practice long since I am wholly at a loss to say. The advantage and success of this system is so apparent that it only requires to be once known to become universally adopted, first, when a frame, pot or pan is covered completely, it ensures one uniform moisture and temperature; consequently every seed possessing the merest life will be sure to grow, and also save that continual watching—so necessary in the old style—and lessen to a minimum the anxiety of raising valuable seed."

When the plants have reached a size at which they can be handled, the choicer varieties should be carefully pricked out into pots, pans or boxes, shading them till well established and then gradually inuring them to the sun. This will enable them to make strong sturdy plants, with plenty of roots that will transplant well and produce an abundance of handsome flowers.

Transplanting.—This should always be done if possible in moist cloudy weather, but should it be hot and sunny, seed-beds, pots, &c., should have a liberal watering before the plants are removed, taking care not to let the young roots or fibres get dry by too long exposure to the sun and air. Water immediately after planting, and shade from the sun till the plants are established. It is an excellent plan to cover each plant with a small flower pot during the day, removing it at night; by this system transplanting may take place with safety in the hottest weather.

Looseness of Surface.—The value and importance of frequently stirring the surface soil cannot fairly be over-estimated in its beneficial results to all kinds of garden crops and flowering plants. The soil should never be allowed to cake or harden, but after rain or watering, should be carefully gone over, and the surface broken

or loosened with some such implement as a trowel, or hoe, and the slight admission of air thus obtained will give a great impetus to the growth of the plants.

Prologation of the Blooming Period.—In most kinds of *Annuals* the time of flowering may be considerably lengthened by carefully picking off the seed pods or vessels when the flowers are past their best, or beginning to decay. This prevents the plants ripening seeds and induces a continuance of blooming and vigour.

Liquid Manure and Watering—Liquid Manure, when judiciously applied, is very beneficial, especially to plants whose roots are confined, as in pots, &c., but should never be given to very young plants nor oftener than twice a week, and then not in extravagant quantities. An excellent Liquid Manure can be easily made by filling an old tub about half full of fresh cow-dung or horse-droppings, fill up with water, and stir occasionally a day or two before using, and fill up with fresh water from time to time as the liquid is used, till the quality is exhausted. *Soot* also makes an excellent manure when mixed in the proportion of six quarts to a hogshead of water. *Guano Water*, made by adding one ounce of guano to about six gallous of water, is highly stimulating to most kinds of flowering plants and bulbs. All seeds when sown should have a gentle watering with a fine rose water-pot, and on no account should they be allowed to become dry when germination has once commenced. Plants in pots should only be watered as often as the surface of the soil becomes dry, and not daily or periodically, regardless of the state of dryness, as is erroneously practised by some amateurs, to the frequent injury and sometimes destruction of the plant.

ARRANGEMENT OF COLOURS.

It is probably a better understood, and in some respects an easier matter, to propagate and cultivate the necessary stock of plants to fill up a Flower Garden, than to arrange them according to the laws of colour, or so as to produce a pleasing and harmonious effect. In many respects even those who are best versed in the principles which ought to guide the gardener in this important matter, have difficulties to contend with which are unknown to the most intelligent colour-theorist. One of these difficulties—and one that is not easily overcome—arises out of the varieties of height and habit of the plants, which are to the gardener what paints are to the painter. Another very formidable one is the unsuitableness of many garden designs, especially in those where the beds are very large and too close together; or, what is equally unfavorable, they may be long and narrow, and much too near the points from which they can be critically viewed.

Under such circumstances it is not unfrequently most difficult to apply the principles of either harmony or contrast of colours, and at the same time give essential prominence to symmetry; modification is therefore forced upon the gardener, and, consequently, very much depends on good taste and long and careful observation in combining plants of various heights and in dealing with designs which are unsuitable for purely scientific arrangement. But at the same time there are few places, not even in the smallest of gardens, which do not afford an opportunity to some extent for a definite system of arrangement. A single bed in an isolated position, may be made to display the effects of either harmony or contrast, or both, in flower gardening, and even where such difficulties as I have named exist, there is no doubt, as I have previously remarked, that glaring errors are only to be avoided by having a knowledge of the simple elementary principles which govern the harmony and contrast of colours. Experienced practitioners have generally by them a plentiful store of notes carefully made in former years when the flowers were in their prime. Each combination of plants that, though not strictly in accordance to scientific dicta, has been chaste and pleasing, has been carefully noted; and the planting of a flower garden to such becomes a work of much less difficulty than to the inexperienced. But it is impossible to apply individual practice to a great variety of circumstances and designs, and for that reason theory is here of more than usual importance.

Arrangement of Colours in accordance to the law of contrast.—The experiment of admitting a ray of sunlight through an aperture into a dark room, and after it enters making it pass through a triangular glass prism on to a white wall on the opposite side of the room, analyses the light and shows us of what colours it is composed. Immediately on passing through the prism it is dispersed and forms on the wall an oblong figure of seven different colours. This is in fact light analysed and its component parts shown, analogous to the way a chemist acts upon matter. Newton, the great philosopher, has denominated these seven colours simple or homogeneous.

The better to understand the arrangement and relation of these prismatic colours, let them be printed on a circular card in the order and proportion exhibited by the prismatic spectrum and rainbow. The circle is divided into 360 degrees, which allows space for each colour in the same proportion as in the spectrum, namely violet, 80°; indigo, 40°; blue, 60°; green, 60°; yellow, 48°; orange, 27°; red, 45°.

Here we have the simple prismatic colours arranged in the same order and proportions as are demonstrated by the prismatic experiment, only in a circular instead of an oblong form, in which

latter, as produced by the prismatic rays, violet forms one extreme and red the other. Red, blue and yellow have been termed the three primary colours because the others can be produced by mixing these in different proportions; and it will be observed that the other colours,—violet, indigo, blue and orange—are intermediate to their arrangement in the spectrum. Now in order to ascertain correctly which are the contrasting colours, we will take violet, and wishing to find its contrasting colour we have only to find out which colour is directly opposite to it on the diagram, now if we draw a line from the centre of the space occupied by violet to the opposite side of the circle, its terminal end will be in green, but near to yellow, which determines that the contrasting colour to violet is green with a little yellow mixed, or bluish green, and so on, by drawing a line from the centre of the remaining arc—the end of the diametric line—determines the contrasting colour.

M. Buffon, a good many years ago, made an interesting discovery, which is practically very useful, and very closely approaches in correctness the diagram principal in determining the colours which contrast. He discovered that if a wafer be placed on a white sheet of paper and gazed steadily at for a few seconds, and then the eye removed to another part of the paper, a spectrum of the same size as the wafer, and of its contrasting colour, will be seen. The spectra are, however, rendered more distinct when the wafers are looked at on a dark ground and the eye then directed to a white ground. This simple fact is the reason why black printing is more comfortably and easily read on a white ground than red, for red would have a contrasting green spectrum floating before the eyes on a white ground; white being the contrast to black, the spectrum is presented in such a combination. By this simple process, as well as by the aid of the diagram mentioned, the colours at the disposal of the flower gardener can be arranged according to the law of contrast. The following is a table of the colours and their contrasts:

Black	...	...	...	White.
White	...	...	...	Black.
Red,	...	...	...	Bluish-Green.
Orange,	...	...	...	Blue.
Yellow,	...	...	...	Indigo.
Green,	...	...	...	Reddish-Violet.
Blue,	...	...	...	Orange.
Indigo,	...	...	...	Orange-Yellow.
Violet,	...	...	...	Bluish-Green.

These are the contrasting colours as determined according to Buffon's spectrum discovery, and it will be found that these results closely correspond with those determined by the rules of

the diagram. The merest tyro will find the application of these rules of great service in the arrangement of flowers on the principle of contrast. Of course there are intermediate shades to be dealt with not embraced by the colours included in the spectrum, and just in the proportion as these shades approach the various prismatic colours, so must the rules be modified and applied. Buffon's system can always be resorted to as a guide sufficiently correct for all practical purposes, and followed as closely as the various shades and different heights of plants will allow, cannot fail to be of great service in flower-garden arrangements.

Arrangement of Colours according to the law of harmony.—Colours are said to harmonize when different shades blend insensibly into each other. This is easily determined by any one who has a perception of, or, what is generally termed, an eye for, colour. Harmonizing colours can be as readily determined by the use of the diagram which has been described in order to show those that contrast. That which harmonizes with any original colour is always next the original and between it and the contrasting colour in the order of the diagram. Following out this it will be seen that red is the harmonizing colour to orange, blue to violet, yellow to white, and so on.

Practically speaking, harmonizing colours are considered more easily detected than those that contrast; take for instance red or scarlet, dark, pink, pale pink, and white, and place them in the order named, and a pleasing harmony from red down to white is the result. The transition is gentle and beautiful, something like a plaintive melody in music. Then again take a purple flowering plant with a shade of red in it and place it near a crimson, or let a golden-leaved plant be associated with another species having silvery foliage, and a most delicate and pleasing harmony is produced, and becomes delicious food to that man who "does not live by bread alone."

These examples are enough to show what is conveyed by the term harmony of colours; and there are few things that afford more pleasure to an eye, however slightly trained to colour, than the contemplation of the soft gradations that may be worked out in a bed of flowers associated according to the principle of harmony. It is somewhat degrading to the art to look upon it merely as a means of embellishment capable only of tickling the eye.

Harmony and contrast may also be illustrated with charming effect in one design or bed. What, for instance, can be more lovely than a centre of yellow, with a corresponding zone of white finished off with a fringe of blue or purple? The two centre colours harmonize while the blue contrasts; or if two contrasting colours—yellow and blue—are mixed in the centre of a bed, and edged with red, which harmonizes with the orange, the effect is

very fine. In filling a bed with three colours in distinct zones, the two harmonizing colours should always be in the centre and the contrasting colour as a margin, and I prefer the softest colour always in the centre. This system of planting is particularly applicable to an isolated place, because the eye comprehends and grasps the design better with the soft colour in the centre than at the margin. With a strong colour for a centre the eye is tyrannically attracted to the weight of heavy colouring.

When plants of various heights and habits have to be dealt with, the symmetry of the bed should not be sacrificed even in deference to the laws of colours which certain plants will set at defiance. Taste must in such cases step in and take the place of the rigid rules of science, but it requires much observation and practice to avoid incongruous arrangements. The late Dr. Lindley once wrote some articles in the *Gardeners' Chronicle*, contending that symmetry was of greater importance than any arrangement of colours, and pointed to the capricious ways in which nature arranged various colours in individual flowers. But he might also have pointed to many combinations which are in accordance with recognised principles of harmony and contrast—even to the “crimson-tipped Daisy” with its yellow disc and white zone in beautiful harmony, and its crimson tips in illustration of the principle of contrast and harmony too. To a certain extent the learned Doctor was correct, but it would be a sad sacrifice to accept his position as a rule.

Where plants are of various heights, and when it is desirable to associate a dwarfer and taller plant in one bed, much can be done towards achieving this successfully by throwing a portion of the soil from that part of the bed or border where the taller things are to be planted on to the space designed for the dwarfer. As a general rule, however, the taller plants should be put in the largest beds and *vice versa*; and all beds exceeding 12 or 14 feet in diameter should be planted with two or more colours, in order to relieve the heavy mass of colour; and, as already referred to, the strongest colours should be at the margin, in the case of isolated beds particularly. In planting a group of beds on the complementary principle, the centre or key bed should never be the most brilliant as it is often made. The stronger colours should be towards the extremities of the design; for, as any one who has studied the matter knows, with soft tones towards the centre and brighter hued beds towards the outside, the eye takes in and can master the design much better than with the bold colours at the centre.

All geometrical designs should have each corresponding bed planted not only with the same colours, but with the same plants, if possible, otherwise the unity of expression which should characterize all such designs will be destroyed.

VARIETIES.

In this country we have a very much larger field from which to make a selection than those residing in a more temperate climate, for under this head we must include a very large number of species which are ordinarily cultivated as biennials or perennials, amongst which may be mentioned Antirrhinums, Pansies, Daisies, Carnations, Cinerarias, Dianthus, Hollyhocks, Myosotis, Petunias, Pyrethrums, and also Verbenas.

The first consideration should be to obtain good seeds, and those who have but little experience should invest their money cautiously in a few of the more hardy and popular kinds. Half-a-dozen good plants well cultivated, will give more pleasure than twice their number neglected. Always be careful to get seeds suited to the purposes for which they are intended. If a climber be desired to cover a fence or trellis, the Morning Glory, the climbing Nasturtium, and similar plants will give satisfaction; while some of the more tender climbers will not be likely to come up if planted in such a situation as this, and if they do happen to grow, will not cover the place designed for them, and disappointment will be the result. If the object be a brilliant, showy bed on the lawn or in the border, the Petunia, Phlox Drummondi, Verbena, &c., will meet one's wishes; while a bed of Mignonette, or any of the smaller or less showy flowers, would be entirely out of place. If flowers of taller growth be desired for a showy bed more in the back-ground, the Zinnia, the French Marigold, Datura, &c., are admirably adapted, while some very beautiful dwarf-growing flowers would be worthless; even good flowers are sometimes condemned merely because they are out of their proper places. For instance, it would be wrong to sow Calceolaria and Cineraria, and other very delicate seeds in the open ground and in soils where a Cabbage would hardly condescend to grow. The best soil for most flowers, and especially for young plants, and for seed-beds, is a mellow loam, containing so much sand that it will not bake after hard showers. If we have not such a soil, we must, of course, use the best we have, and as but little success is to be anticipated with delicate seeds in a stiff, clay soil, advantage must be taken of the various plans to ensure their proper germination. It is useless to try to grow good flowers on a poor, or a hard, unbroken soil, or in a bed choked with weeds. In either case the plants become dwarfed, arrive at maturity too early, and flower and ripen their seeds before they have attained half their natural size, and about the time a good robust plant would be forming its buds. Such a soil can be much improved by a little sand, or ashes and manure and by pretty constant working. It must not however, be handled when too wet. The flower garden should always be so drained that no water will stand on or near the surface. The manner in which seeds are sown is another important

matter, and one in which beginners are most likely to fail. One "forget" may ruin a whole sowing of the choicest seeds. Of course, there are some kinds of seeds that are robust and that will grow, no matter how they are treated; but others require careful treatment. Many seem to think that seeds will grow anywhere and under any circumstances. They have learned that seeds of some trees and plants will grow without planting and care; and from these facts they get the idea that it is of little importance how or where seeds are sown, provided they are in the ground. But it should be considered that such seeds are usually large, and produce stronger and more robust plants than those used in the garden, and that thus they are enabled to bear more hardships and to live under more unfavourable circumstances. Another fact should be remembered—that not one seed in a thousand matured by our forest trees and shrubs produces a living plant. A forest tree will produce seed enough for an acre of closely set plants, and perhaps not a dozen will grow. We cannot afford to purchase costly seeds and lose such a large proportion, which we shall do if we plant in the same manner. If cultivators would be satisfied with only the most hardy and prolific flowers, such as would take care of themselves, they might pursue a careless system of planting and cultivation, and fill their grounds with plants; but they crave for flowers that are not natural to our climate—those that flourish in other climes and under more genial skies—their dazzling beauty, their delicious fragrance, must be secured at almost any cost of time and labour. This is all very well; but having made up our minds to possess such treasures, we must pay the price—we must study their habits and treat them accordingly.

SELECTION OF VARIETIES.

This will of course depend upon the way in which the plants are to be grown, whether intended for pot culture, to be raised in pans and then transplanted, or for sowing at once in the open ground. The latter method is one that recommends itself to a large class of amateurs who, though desirous of seeing their gardens as gay as their neighbours', do not care either to undertake the trouble or expense entailed by adopting either of the former methods. I will therefore first give a short list of varieties specially adapted for sowing in the open air. One of the first that will recommend itself is the Candytuft, of which there are now several shades of colour ranging from pure white to deep crimson. Most of the Candytufts are garden varieties, but all are so good and distinct as to be well worth growing; and besides being useful in beds and borders, they are also well adapted for rockwork or banks, in either of which positions they spread rapidly and flower profusely. Callicopsis, too, are very showy annuals, having brilliantly coloured flowers, the most noteworthy amongst them is *C. bicolor*, a very bright and effective

kind, and the *C. cardaminifolia* varieties. *Calliopsis* should not be sown till the end of October as it is very sensitive of damp, and if sown too early almost invariably succumbs to the first shower. The annual varieties of *Chrysanthemum* are also very fine, and when better known are sure to be largely grown, as the flowers besides being of large size and fine form, are beautifully marked and of great value in a cut state. Besides the single varieties, there are several double ones, the flowers of which are as large as marigolds, to which in form and appearance they bear a close resemblance. If sown by the end of October they will commence to bloom in February, and continue on till the commencement of the rains. Being strong growers, from three to five in a patch are quite sufficient, as they require much space. All the *Clarkias*, of which there are many varieties, are well worth having and they do well in moderately good soil. *Convolvulus minor* should be largely grown for bedding in the N.-W. P., a purpose for which its dwarf habit and continuous blooming qualities render it specially suited, and where their rich blue and violet colours make them particularly telling. *Eschcholtzias*, too, such as *E. aurantiaca*, *E. Californica* and *E. Mandarin*, are wonderfully showy, and will grow almost anywhere as regards soil, but they like sun, and when exposed to its influence send up their large gorgeous *Tulip*-like flowers in the greatest profusion.

GODETIAS AND EVERLASTINGS.—*Godetias* are all so strikingly beautiful that no garden should be without them, and they are amongst the easiest annuals to flower. *G. Whitneyi* is the largest and finest; this variety bears flowers of a satiny crimson blush colour, and in good soil they measure quite four inches across. In shape and appearance they are *Mallow*-like, but the plant has thick lance-shaped leaves, and is very compact in habit, and blooms with remarkable freedom. The next in point of merit are *Lady Albemarle*, *The Bride*, *Duchess of Albany* and *Princess of Wales*, all of which, and several others, are garden varieties that have originated from the first named, but are different in shade and in the rich marking of their blossoms. *Helichrysums*, better known as *Everlastings*, are invaluable both for decorative purposes in borders and for the embellishment of vases in rooms, where, if gathered before they become too fully expanded and dried in the shade, they last fresh and preserve their colour for a very long period. *Helichrysums* are not very particular as to soil and will flourish almost anywhere, but like sun and a warm dry situation where they grow to perfection.

LARKSPURS AND LUPINS.—*Larkspurs* are exceedingly showy annuals, good alike for beds and borders, as they may be had both tall and dwarf, and their flowering habit is quite unsurpassed. Seed of these should not be sown till November or before the cold weather has well set in. *Lupins*, with their large, long spikes of

Pea-shaped flowers, are also very showy border plants, where the large kinds should be grown singly, but the smaller sorts, such as *A. affinus*, may be grown in clumps. Poor sandy soil suit Lupins well, and they bloom better in it than in that which is rich.

MIGNONETTE AND NASTURTIUMS.—Mignonette is too well known and appreciated to require more than a passing notice, but common Mignonette is now so far eclipsed by the newer varieties, such as Miles' Hybrid Spiral, Machet, Giant Pyramidal, and Victoria, as to look, comparatively speaking a mere weed. Nasturtiums have also long been favorites, and they have been improved to that degree as to render them amongst the most desirable of plants to have in a garden, for if there is an unsightly object, to cover, one has only to put in a few seeds of the climbing kinds, and they will soon be up and adorn it with beauty; or if there are beds to fill where a display of vivid colours is required, we have only to turn to the Tom Thumb section to obtain all that is needed. These kinds are dwarf and compact, and send up a profusion of their large brilliant blossoms. Unlike most annuals, they bloom best in poor soil: when grown in that of a deep rich character they run too much to leaf, and are not so short jointed and close in habit.

SWEET PEAS—Must not be forgotten, as with a few patches of them in the borders running up twiggy sticks, or a row in the garden, there is always something to help to fill up the flower basket and dress up epergnes. As there are so many sorts, except where a special colour is required, the best plan is to get a large packet of mixed seeds and sow them together, in which manner the blending of the different shades produce a pleasing effect. To have Sweet Peas strong, they should be sown early, and to keep up a supply it is well to make another sowing later on if necessary.

NEMOPHILAS—Are very beautiful, dwarf and floriferous, and the well-known *N. insignis* is still one of the best of them. Sow at the commencement of November.

The above list by no means exhausts the many beautiful plants that can be raised from seed in the open ground. It merely furnishes a selection of reliable kinds that can be depended upon. The following may also be grown in beds or borders, but being more tender, must first be raised in pots or boxes under shelter, and planted out when sufficiently large.

ANTIRRHINUMS.—The old familiar Snap Dragon still retains its position as one of the most useful bedding plants we possess; easily raised from seed, growing vigorously and blooming continuously for months. Seed may be sown any time from October 1st, to the middle of November, but the earlier the better. Use a light rich soil, scatter the seed thinly over the surface and cover with a pane of glass, over this place a layer of moss to keep out

the light, or an old newspaper will answer the same purpose ; watch carefully, and as soon as they commence to germinate remove the glass at once ; gradually, inure the seedlings to the air and light, but protect carefully from heavy rains ; red ants have a peculiar partiality for the seed of this plant, so they must be carefully guarded against.

ASTERS.—It is to be feared that many people refrain from growing these beautiful Annuals under the impression that they are very difficult to grow ; such is not however the case, good Asters may be grown as easily as good Pansies or good Petunias, in fact frequently with much less trouble ; the main thing is to make a good start by inducing the seed to germinate, and then the only real difficulty has been surmounted. There is no gainsaying the fact that the seed soon loses its vitality and must be kept very carefully to insure its germinating ; the slightest carelessness in exposing it to a damp atmosphere, even for a very short time, invariably destroys its vegetative powers. Of the imbricated varieties none equal the Victoria Aster. The Chrysanthemum-flowered and Bouquet Asters are very dwarf and floriferous, and Truffaut's Peony Perfection is a strong grower with immense flowers. The Quilled Globe Asters are very beautiful when well grown, and are worthy of special care. It is only necessary here to say that they should have from the first a light, rich, porous soil and liberal treatment.

DAISIES.—The modest Daisy is a favorite with every one, and is most easily raised from seed, and it is certainly surprising that they are not more generally grown. They require the same treatment as recommended for Antirrhinums. The seedlings, as soon as they are large enough to handle, should be pricked out into pans or boxes about an inch apart, where they may remain till they are strong enough for bedding out or for planting into their blooming pots.

DIANTHUS.—The various forms of *Dianthus Chinensis* are amongst the most useful annuals grown in our Indian Gardens. Seed should be sown in pans of light rich soil as thinly as possible, and be transplanted into their blooming quarters as soon as they have made six or eight leaves, placing them six to eight inches apart in the beds. *D. diadematus flore pleno* is undoubtedly the gem of the family, the flowers being extremely large and intensely double, embracing all the various tints of lilac, crimson, purple and maroon, the fringed edges of the petals being pure white or black. *Dianthus Laciniatus flore pleno* closely resembles the above, but the petals are more fantastically marked and the edges deeply lacinated. *D. hybridus* produces handsome flowers of various shades of colour, and more closely resembles the old fashioned garden Pink than any of the preceding. *D. Chinensis*

flore pleno is another distinct class, producing dense heads of fantastically marked flowers, in habit of growth somewhat resembling the Sweet William.

LOBELIAS.—The seed requires the same treatment as recommended for Daisies. These are amongst the most useful of all bedding plants, and form a most pleasing contrast to many of the more gorgeously coloured varieties, they are therefore specially adapted for edgings of beds and borders.

PHOLXES.—Phlox Drummondi and its many varieties are quite distinct from the species and varieties of perennial Phlox. They are all useful plants for bedding, as they continue to bloom throughout the season. They flower freely, and their blossoms are richly coloured and of many hues, which makes them useful in a cut state. The seed should be sown any time during October, in pans or boxes under shelter, and the seedlings when large enough, should be pricked off into other pans of rich light soil. When gradually hardened off they will be ready to plant out early in November.

PETUNIAS.—The Petunia although a perennial can only be successfully grown as an annual in the plains, and as such form an excellent bedding plant. It may be treated in all respects the same as recommended for Daisies, but care must be taken that the plants are not bedded out until all danger of heavy rain is over. They will generally commence to bloom in January, and will continue to flower freely until destroyed by the rains.

STOCKS AND WALLFLOWERS.—The many varieties of Double Stock are exceedingly beautiful, fragrant and useful Annuals but neither these nor German Wallflowers can be recommended for culture in Bengal, though they thrive splendidly in the North-West Provinces.

WATERING.

The great aim in the cultivation of Annuals is to secure a quick, vigorous, healthy growth. To insure this, the plants must be kept regularly and plentifully supplied with water, and occasionally drenching the soil with weak liquid manure will be found of great benefit to nearly every description of plants.

CULTIVATION IN POTS.

It is customary in this country to grow a large variety of Annuals in pots or pans, and if proper attention is paid to them they may be cultivated most successfully in this way. The pots should be filled with the same compost as that recommended for sowings in the open ground, careful attention being given to their proper drainage. After the plants are well established they must be kept liberally supplied with water, and a dressing of weak liquid manure should be given at least once a week. It is advisable, when convenient, to sink the pots up to the rim in the ground until the plants commence flowering.

DESCRIPTIVE LIST
OF
Annuals, Perennials, &c.
WITH CULTURAL NOTES.

ABRONIA. Nat. Order, *Nyctaginaceæ*.

A small family of very floriferous Annuals, of a trailing habit, with succulent stems, flowers somewhat resembling those of the Verbena. Seed should be sown early in October either in the open ground or in pans. To grow them to perfection they require a light, rich soil, with plenty of drainage, for if water lodges near the stem they are very apt to damp off. If properly grown they will bloom freely by February, and continue in flower till the approach of the hot season, when they will at once die off. Some cultivators recommend that the outer skin of the seed should be peeled off before sowing. The following are the best varieties:—*A. arenaria*, with yellow flowers, and *A. umbellata* and *A. fragrans*, both with rose coloured flowers.

ABUTILON. Nat. Order, *Malvaceæ*.

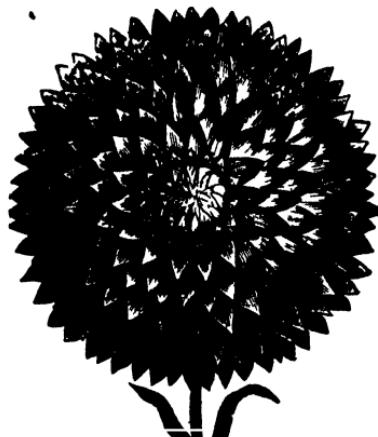
Splendid flowering shrubs with beautiful bell-shaped flowers, two to three inches in diameter; continues in bloom throughout the year. Sow seeds in pans during September and October and plant out when about 3 inches high in good rich soil, will flower freely the first season. Sow in the Hills in April or May.

ACACIA. Nat. Order, *Mimosæ*.

The genus *Acacia* is well represented in the native flora of India, but most of these grow to such a large size as to be inadmissible in gardens; *Acacia lophanta* is, however, an exception to this

rule. It has a close, compact, and erect habit, which permits it to be closely associated with flowering plants without shading them. By confining it to a single stem we get the fullest size and grace of which the leaves are capable. It may be raised from seed as easily as any annual and in six months makes fine plants for decoration.

ACROCLINIUM. Nat. Order, *Compositæ*.



ACROCLINIUM ROSEUM FLORE PLENO.

A very handsome species of everlasting, easily cultivated in this country. Seed should be sown with the other annuals in October, and if planted in a good soil will grow to a height of about three feet, and be in full bloom early in February, when it forms a very attractive object. Varieties:—*A. roseum* and *A. album*. Double varieties of both of these species have recently been introduced and are certainly a wonderful improvement on the original forms. Sow in April in the Hills.

ADONIS AUTUMNALIS. Nat. Order, *Ranunculaceæ*.

This is also known as *Flos adonis* or Pheasant's Eye. It grows to the height of about one foot, and when sown in large masses has a very pretty effect. It is not, however, adapted for planting out singly, as the plants individually have rather a straggling appearance. The flowers are of a bright scarlet hue. The seed should be sown in October, in the place where the plants are intended to remain, as it does not bear transplanting well. It thrives best in a damp, shady situation. There are also several other varieties of *Adonis* but most of them have very insignificant flowers, and are hardly admissible in a garden.



ADONIS AUTUMNALIS.

ALONSOA. Nat. Order, *Scrophulariaceæ*.

A small group of annuals, but rarely seen in this country, of a neat habit, with peculiar shaped, and not very attractive flowers. Seed should be sown in October in the place where the plants

are intended to remain. They require no care beyond being kept liberally supplied with water. The best known variety amongst us is *A. incisifolia*, but in addition to this, there are *A. grandiflora*, *linifolia*, *myrtifolia* and *Warczewiczi*. The colour of the flower in all the varieties is much the same, namely, a rather dull scarlet, except the latest addition to this family *A. albiflora* the flowers of which are creamy white.

AGERATUM. Nat. Order, *Compositæ*.

A small group of very handsome showy Annuals that grow to perfection in this country during the cold season. They require a

very light, rich, sandy soil. The seeds should be sown in pots in August or September, and as soon as the plants are strong enough, they should be planted out in the border. They must be carefully shaded till well established. The following are among the best varieties :—

- A. *coelestinum nanum*.
- A. *Lasseuxi*.
- A. *mexicanum*.
- A. *mexicanum rubrum*.
- A. *odoratum*.
- A. Imperial Dwarf Blue.
- A. " " " White.
- A. Countess of Stair.

AGERATUM, IMPERIAL DWARF.

ALYSSUM.—Nat. Order, *Brassicaceæ*.



ALYSSUM, LITTLE GEM.

Sweet Alyssum or *Koniga maritima* is an unpretending little annual but deliciously scented; should be grown in large masses, the new dwarf variety Little Gem is a great improvement on the old form and should certainly find a place in every garden, seed should be sown immediately after the rains in the place where the plants are to remain.

AMARANTHUS.—
Nat. Order, *Amaranthaceæ*.

This extensive family is so well known in this country that it is hardly necessary to give any hints as to its cultivation here; in fact it will succeed anywhere, and under almost any treatment, provided it is kept liberally supplied with moisture. The seed is best sown early in July, in pans, and the plants put out in the open ground as soon as they are sufficiently strong. The soil for them should not be made too rich. Otherwise they are apt to grow coarse, and do not then colour freely. A large number of new varieties have been introduced during the past few years, the best of which undoubtedly are the following :

AMARANTHUS BICOLOR RUBER.—One of the most brilliantly coloured varieties yet introduced, very effective in large masses.

AMARANTHUS CAUDATUS.—(*Love lies bleeding.*) An exceedingly graceful free flowering ornamental plant, about two feet high.

AMARANTHUS HENDERI.—Foliage rosy carnine, orange, golden yellow and olive green, a beautiful drooping variety.



AMARANTHUS MARGARITAE.

AMARANTHUS, PRINCESS OF WALES.—Very distinct and beautiful, the remarkable blending of colours in the foliage is hardly equalled by any other annual in cultivation.

AMARANTHUS PYRAMIDALIS NOBILIS.—Each plant is crowned with an enormous flower spike, while from the central flower stem branches spread in every direction, each bearing spikes of bright purple flowers from eight to twelve inches in length.

AMARANTHUS SALICIFOLIUS.—Generally known as the “FOUNTAIN PLANT,” gracefully drooping willow shaped leaves, brilliantly banded and tipped with orange, carmine and bronze.

AMARANTHUS MARGARITAE.—A splendid novelty entirely distinct from any other variety, the flowers are borne on upright spikes as shown in the illustration and are of the richest crimson, the plants form dense bushes about eighteen inches high and the same in diameter, and when well grown appear to be all bloom, scarcely any of the foliage being visible

AMARANTHUS MELANCHOLICUS RUBER.—A splendid dark foliage variety, one of the best for bedding out.

ANTIRRHINUM. Nat. Order, *Scrophulariaceæ*.

Possibly in hardly any other class of hardy plants has so much improvement been effected in so short a time by the art of hybridising as with the Antirrhinum or Snapdragon. A few years since the only varieties known were the old white, yellow, and crimson. Now we see them in almost every shade of colour, and also striped and maculated, and not only in the colour of the flowers has an improvement been effected, but we now have distinct classes of them varying in height from five or six inches up to two feet. The dwarf varieties are especially valuable for this country, flowering much more quickly than the larger growing sorts. This is a great advantage, for although the plant is naturally a perennial, it is best grown here as an



ANTIRRHINUM MAJUS.

Annual, for it is only with difficulty that plants can be kept over to the second season; and unless the larger kinds are sown very early, it takes the whole of the cold season for them to complete their growth. Seed should be sown at the end of September, or early in October, in pans, under shelter. As soon as they are about two inches high they should be planted out, at a distance of twelve to eighteen inches, for the larger kinds, and six inches for the dwarf. The soil for them should be as rich as possible.

In the Hills, the Antirrhinum may be grown as a perennial, seed sown early in March will produce fine blooming plants the same year, if it is desired to keep the plants over till the following season the flower spikes should be removed as soon as the blooms fade, as if the seed pods are allowed to ripen, the plants become so weakened that they frequently succumb during the winter. The varieties have been so much improved of late years and will produce from seed such a charming and profuse variety of colours, that it is now unnecessary to attempt their propagation by any other means.

AQUILEGIA. Nat. Order, *Ranunculaceæ*.

The Aquilegia or Columbine is undoubtedly one of the most beautiful perennials in cultivation, unfortunately however but few varieties are suitable for growing in the plains as, although many of them may be kept safely through the hot and rainy seasons, they can rarely be induced to bloom, the only exceptions to this rule are the beautiful *A. chrysantha*, and varieties of the *vulgaris* type, these if sown by the middle of September and treated liberally will flower profusely by March or April. In the Hills the whole of this family grow most luxuriantly, seed should be sown early in spring and the plants put out when about two or three inches high, they require a good rich well manured soil, and when once established in a garden they generally reproduce themselves freely from self sown seed. In the Himalayas at an elevation of 6,000 to 9,000 feet we have several beautiful indigenous varieties, the best of these *A. Himalaicus* was only introduced in Europe last year, the seed of which was sent home by me for the first time in 1889.



AQUILEGIA, DOUBLE HYBRIDS.

ASTERS. Nat. Order, *Compositæ*.

This is a very extensive family of exceedingly showy Annuals, known as French, China and German Asters. These again are subdivided into an immense number of sections. The German varieties especially are extremely beautiful, and when well grown nothing can exceed the chaste loveliness and exquisite blending of colour of a well arranged bed of Asters, and hardly any plant can be more easily raised and grown to perfection. The German varieties are generally divided into four distinct groups, namely, the Peony flowered, with long incurved petals, the Victoria, with perfectly imbricated flowers, the Chrysanthemum flowered and the Quilled or Globe flowered. The seed should be sown as early as possible after the rains, or for pot culture, sowings may be made under shelter during September. Sow the seed in boxes or pans of light, rich, soil, covering very lightly, and after giving a slight watering, place in a sheltered position until the plants come up, when they should have the full benefit of sun and air. As soon as large enough to handle, they may be transplanted into pots or pans filled with very rich soil.

The soil that suits them best is a compost of equal parts of leaf mould, old cow manure and good garden soil, with a small quantity of coarse sand added. Great attention must, however, be paid to their drainage, as the plants are very sensitive of damp. The healthy growth of the plants, and the development of fine blooms, are greatly assisted by occasional applications of weak liquid manure up to the time of the plants showing flower, when it should be discontinued. If particularly fine blooms are required, the buds should be carefully thinned out on each plant, leaving only three or four of the strongest. The taller growing varieties will require to be carefully staked before coming into flower.

Seedsmen offer under the term Victoria, Paeony-flowered, Crown-flowered or Cocardeau, Chrysanthemum, Bouquet, Emperor, Porcupine, and Quilled, some two dozen kinds of Asters that are largely increased in each case by several diversities of colour, so that a complete collection of all the kinds offered by any one Continental grower would probably comprise some 200 or more forms or hues of colour. So much variety is bewildering rather than otherwise, inasmuch as it is scarcely possible to select the best kinds at a guess, or to grow all in a circumscribed space. There are several distinctive methods by which the Asters may be classed, such as comparative height, habit, character of flower, suitability for exhibition, for pot culture, or for bedding. Tall Asters comprise the fine Paeony-flowered, the tall Chrysanthemum, the Emperor, the tall Victoria, the Quilled, and a few others. Kinds of medium height are found in the dwarfer forms of the Victoria, the Cocardeau, the Rose, and the Porcupine; the dwarf forms comprise the short Chrysanthemums, the dwarf pyramidal, and specially the dwarf Bouquet, which is one of the most beautiful of all for pot culture. The best bedding kinds are found in the medium-growing Victorias, the Rose, and the dwarf Chrysanthemum, as these vary from 9 in. to 12 in. in height and form good bunches of bloom on each plant, and collectively fine masses of colour. The dwarf Bouquet kinds, whilst specially good for pot culture, are also valuable as edgings to beds of taller kinds. For pot culture for exhibition, the best are the medium-growing Victorias, as these, if of a good strain, possess unequalled quality, and present handsome and even heads of bloom. The best examples of the incurved flowers are found in what is popularly known as Truffaut's Paeony-flowered Asters, formerly esteemed a grand exhibition strain, but which has given way to some extent, to the more even and massive Victoria. An incurved flower shows all the tips of the petals converging inward, as is seen in a Chrysanthemum, and the more solid and rotund the form of the flower the better its prospect on an exhibition stand. All of these have flat petals, and, as a rule, have broader petals than any other kinds.

Other Reflexed kinds are the Chrysanthemum and the Rose. Good exhibition blooms of these kinds should have full centres, bright and varied colours, and a compact, dense body of evenly laid petals. Variety is essential, and this can only be had by the introduction of some flowers of the incurved form. This, however, serves rather to show in striking contrast the relative beauties of the distinct forms of flowers. The most complete examples of solidity and perfection of form are found in the Quilled varieties, as these would appear to be made rather than grown. Though not more than half the size of the flat-petalled kinds, they present a mass of quilled petals most evenly set, and in outline almost semicircular. One is almost inclined to believe that such perfection of evenness could only be obtained by artificial means. It is, however, but the result of that constant care in seed selection which is ever the aim of the grower, who prides himself in putting before the public things that are of the finest kind, and of the most meritorious quality. The Cocardeau, or Crown-flowered Asters are partly flat-petalled and partly quilled, the outer margin of the petals being of a dark red or blue, and the centre disc of pure white. These are grown more for their novelty than as presenting special decorative features. This bi-coloured form is, however, also found in some of the finest show-quilled kinds, rendering them both valuable and attractive. The charming Bouquet Asteis are also of a semi-quilled character, the petals being stiff and closely set. The blooms are of medium size and very compact, and acceptable for nosegays. For this latter purpose, however, those who grow Victoria forms will find that the later blooms that start out from the main stems are admirable, the clear bright hues and excellent forms being exceedingly effective however employed.

We are mainly indebted to the French horticulturists, notably Truffaut, Fontaine, and Vilmorin, for the great perfection to which the different races have been brought, nor must I omit to mention the English grower Betteridge to whom we are principally indebted for the many beautiful and chaste quilled varieties. It is worthy of note that the different chasses are so far fixed that they will come true from carefully selected and well ripened seed.

Few annuals have been so much improved during the last few years as the Aster. Not only has it developed into a great variety of forms both in the habit of the plants and the shape of the blooms, at the same time the colours have been so diversified and brightened that only those who are familiar with the recent progress of the flower can have any conception of the magnificent display it will now produce in the garden. The following selection embraces all the most distinct and beautiful classes of this popular flower.



SECTION I.—GLOBE FLOWERED ASTERS.

GLOBE FLOWERED DOUBLE ASTERS.—A very useful class; flowers of good size and very double; one of the best for out-door cultivation.

BETTERIDGE'S OR REID'S IMPROVED QUILLED ASTER.—The finest form of quilled Aster. The extreme edge of the flower is formed by one row of the ray florets. It grows 2 to 2½ feet high, is much branched and very free flowering.

PAEONY FLOWERED GLOBE ASTER.—An incurved variety with very large double flowers, of vigorous branching habit and very free flowering.

SECTION II.—PYRAMIDAL ASTERS.

GLOBE FLOWERED PYRAMIDAL. A very beautiful class, growing to a height of 1½ to 2 feet; flowers extra double, the colours remarkably clear and brilliant.

COMET ASTER.—Differing from others in the shape of flowers, its long, wavy and twisted petals are formed into a loose yet dense half-globe, resembling the Japanese Chrysanthemums; flowers 3½ to 4½ inches across.

COCARDEAU OR CROWN PAEONY ASTER—A beautiful flat petalled variety. The flowers are 3 inches across and peculiarly striking on account of their white centres and broad brilliant coloured margins, after the manner of a cockade.

TRUFFAUT'S IMPROVED PAEONY PERFECTION ASTER.—One of the best and most extensively cultivated classes, having large beautifully incurved flowers of the brightest colours.

TRUFFAUT'S IMBRICATED POMPON ASTER.—A charming free flowering variety of compact pyramidal habit, the growth of the plant being 1½ or 2 ft. high, most useful section for cutting. The flowers, although small, are of excellent form and the best imbricated of all.

VICTORIA ASTER.—This is undoubtedly the finest and most beautiful class in cultivation, the most showy and massive of all the Asters, bearing enormous flowers of great fullness, and is a grand Aster, for exhibition purposes. As the petals curve outward instead of folding in, the Victoria makes a splendid contrast to the Paony flowered varieties.

VICTORIA NEEDLE ASTER.—This kind may be called the “*Ne plus ultra*” of the Hedgehog Asters; it differs from the older variety only by the form of its flowers. The petals forming long closed tubes, which spreading ray-like in large masses to all sides, give the flower the perfect form of a globe.

WASHINGTON ASTERS.—A splendid class, very large flowering, extra double, valuable for Exhibition purposes.

WASHINGTON NEEDLE ASTERS.—A very fine variety, of Pyramidal growth, very double flowers 4 to 5 inches in diameter, with needle shaped petals. This is the largest flowered Needle Aster in existence. A fine exhibition flower.



ASTER, VICTORIA NEEDLE.

SECTION III.—DWARF ASTERS.

DWARF GERMAN ASTERS.—A very free blooming class, strongly recommended for pot culture ; one of the hardiest and most easily cultivated, coming into flower fully a fortnight before any other Aster, plants rarely attain a height of more than 6 to 8 inches.

**ASTER, DWARF PYRAMIDAL.**

IMPROVED DWARF BOUQUET PYRAMIDAL ASTER.—Each plant forms a profuse pyramidal bouquet, cannot be recommended too highly for pot culture ; flowers extra double and remarkably clear and brilliant in colour.

BOLTZE DWARF BOUQUET ASTERS.—A distinct type of close compact habit, a very profuse bloomer ; grows to about 8 to 10 inches high, and is quite constant in habit. A single plant very often bears from 40 to 50 flowers.

SHAKESPEARE ASTER.—This distinct class is acknowledged to be the prettiest of all dwarf Asters, the plants form a compact bush 10 to 12 inches in diameter and only 6 inches high, producing extra double well imbricated flowers.

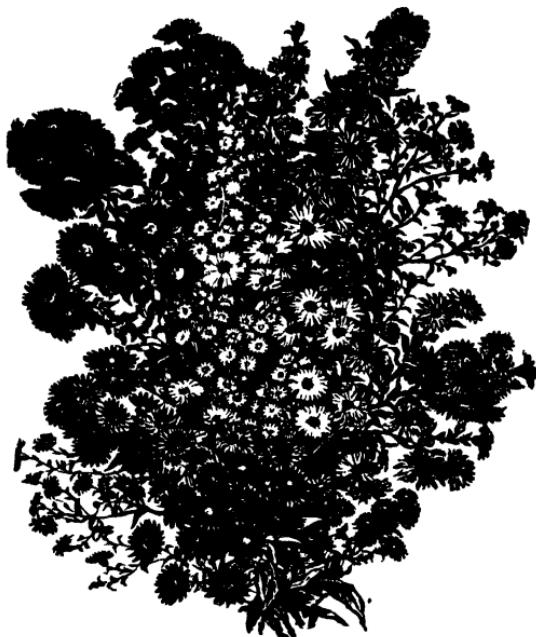
DWARF CHRYSANTHEUM ASTER.—A very useful variety for edging beds, and pot culture ; it is of low growth, stiff habit, and very free flowering, 9 to 12 inches in height, and bearing 15 to 20 flowers on each plant ; the individual flowers are large, often reaching 4 inches in diameter.

**ASTER, WASHINGTON NEEDLE.**

ASTERS.—*Perennial Varieties.*

The Perennial Asters or what are more generally known as Michaelmas Daisies are entirely distinct from the preceding.

Embracing a very large number of species, varying in height from 6 inches to upwards of seven feet—they are of easy culture, in fact will grow anywhere ; seed should be sown at the expiration of the rains, and as soon as the plants are large enough should be potted off singly in good rich soil, shifting on into larger pots as they increase in size—for the great point in their treatment is to give them plenty of pot room, by the

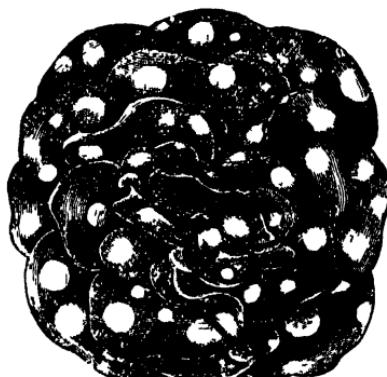


PERENNIAL ASTER.

commencement of the rains they should be strong bushy plants in 7 inch pots, they will now commence to throw up flower spikes and if protected from excessive rains will continue to bloom for months.

THE BALSAM.—*Impatiens Balsamina* Nutt Order, *Balsaminaceæ*.

This beautiful annual deserves a high place in the estimation of every lover of plants. In this country they are so easily grown, and are at their best at a season of the year when but few other plants are in bloom, that no garden can dispense with them, the brilliancy and variety of colour in their flowers being almost unequalled by any other class of annuals. With careful attention Balsams may be grown with flowers of an immense size if raised from imported seed of any of the best strains. During the past few years an immense improvement



BALSAM, CAMELLIA FLOWERED.

has been effected both in the size and colour of their flowers, some of the best varieties now producing blooms frequently upwards of three inches across, and as perfect in shape as a Camellia.

The seed should be sown from about the middle of June to early in September, in pans or boxes of light, rich soil, placed in a sheltered situation. As soon as it has germinated, light and air must be freely given, otherwise the plants will become drawn. When large enough they should be planted singly in small pots, and must be frequently shifted into larger ones, as they increase in size, care being taken to plant them up to their lower leaves each time they are changed. The secret of growing Balsams well is to feed them liberally, and to keep them constantly surrounded with a moist, growing atmosphere. They should therefore be syringed repeatedly, especially during dry weather. The soil they are grown in cannot possibly be made too rich. The best specimens I have ever seen in this country were grown entirely in old cow manure, which was at least four or five years old, with a little coarse sand mixed with it. A compost, however, in which I have found them grow very satisfactorily, is one made of equal parts of leaf mould, very old cow manure and good light soil. In dry weather the plants must be liberally watered, and a weekly dressing of liquid manure will much increase their vigour.



BALSAM, CARNATION STRIPED.



BALSAM, ROSE FLOWERED.

When a very good strain is procured, the plants will produce seed, but very sparingly; they must therefore be very carefully watched, and the pods gathered before they burst open. When the plants are grown in pots, and each colour kept distinct, the produce of the seed saved from them will come fairly true, although the blooms will rarely be so fine as from plants raised from freshly imported seed.

BARTONIA AUREA. Golden Bartonia. Nat. Order, *Loasaceæ*.

A very handsome annual with flowers of a bright golden yellow, somewhat resembling that of the Portulaca, and also like that plant, in the fact that the flowers only open when fully exposed to direct sunshine. Seed should be sown in pans or boxes in October, and as soon as they are two or three inches high may be put out in the open ground. To grow them well they require a very rich soil and an abundance of water. It is advisable to place the plants on small mounds, slightly above the surrounding soil, as, if any excess of water lodges round the stem, the plants will almost invariably damp off.



BARTONIA AUREA.

BOCCONIA.—
Nat. Order, *Papaveraceæ*.

The Bocconia or Plume Poppy forms handsome erect plants from 4 to 7 feet high and is a very ornamental object when properly grown, the flowers are borne in dense panicles. The plant is seen to best effect when isolated, it requires a deep rich well manured soil, seed should be sown at the expiration of the rains.



BOCCONIA CORDATA.

BRACHYCOME. Nat. Order, *Compositæ*.

BRACHYCOME IBERIDIFOLIA.

A dwarf annual with flowers somewhat resembling the Cineraria, which are produced in the greatest profusion. This is one of the most useful varieties of annuals we have, and should be found in every collection. Sow the seed in pans early in October, and as soon as they are strong enough, plant out in the open border, two or three plants together. Varieties—*B. iberidifolia* with blue flowers, and *B. iberidifolia alba* with white flowers.

BROWALLIA. Nat. Order, *Scrophulariaceæ*.

A small annual with very pleasing flowers, but only effective when sown in clumps or patches in the border. Seed should be sown in October in pans, and the plants put out in the ground as soon as they are strong enough. There are several varieties in cultivation, the best of which are *B. elata alba*, *B. elata grandiflora*, and *B. Roemli*.

CACALIA. The Tassel Flower. Nat. Order, *Compositæ*.

Represented in our gardens by *C. aurea* and *C. coccinea*, a very common annual with but little beauty to recommend it. Seed should be sown in October.



CACALIA COCCINEA.

CALANDRINA. Nat. Order, *Portulaceæ*.

A small group of very showy plants, some of which are annuals and others perennials, although in this country all of them must be grown as annuals. Seed should be sown in October in the place where the plants are intended to remain, as it does not bear transplanting well; an exposed position must be selected for them, as, like the Portulaca, its flowers

only open in the sunshine. They should be grown in a rich light soil, and occasional dressings of liquid manure will also benefit them. Sow in April in the Hills. The following is a list of the several varieties now grown :

C. amoena.
C. Burrigdi.
C. compressa.
C. discolor.

C. grandiflora.
C. speciosa.
C. speciosa alba.
C. umbellata.

CALCEOLARIA. Nat. Order, *Scrophulariaceæ*.

This beautiful plant is undoubtedly rather difficult to grow successfully in the plains and more especially in Lower Bengal where the growing season is generally too short to allow of the plants being sufficiently advanced to bloom before the hot weather sets in. In the North-West Provinces and Punjab where the cold season lasts very much longer, I have seen very fair specimens, but it is in the Hills that this plant finds a congenial home. In the plains seed must be sown by September or early in October, and in the Hills also this is the best time to sow, provided the plants can be given the protection of a

frame or glass-house during the winter.

It is of the first importance to procure seed of a good strain, as no matter how much care may be expended on the cultivation of the plants, unless the strain be a good one, the results will not be satisfactory. The following are the chief points in their culture. First a good rich compost, not too light; after filling the pot, if it should be insufficiently moist, a gentle watering should be given, and after standing a few hours, a slight sprinkling of silver sand strewn over the surface. The seeds are then to be sown thinly, pressed down very slightly with a piece of wood and then covered with a square of glass on which a little damp moss should be laid. Keep in a shady position where an equable temperature of about 70° can be secured, in about ten days they should germinate freely, when the covering should be removed taking care, however, to protect them from direct sunshine.

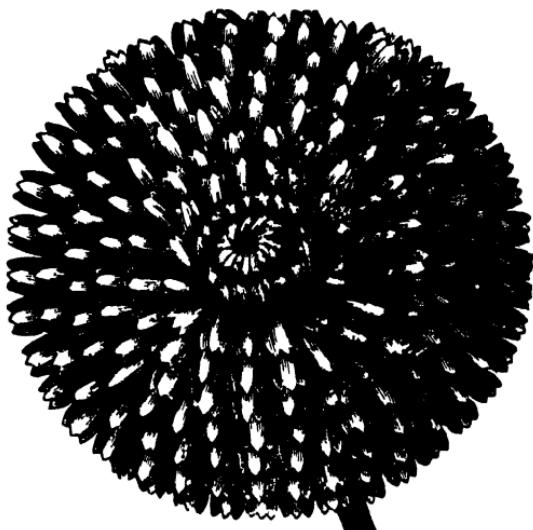


CALCEOLARIA.

When ready for transplanting, use boxes in preference to pots, as in the former an equable moisture at root can be more surely maintained. Two inches from plant to plant is a suitable distance to place them. When the plants begin to get crowded, transplant them singly into 4-inch pots, using a few small pieces of charcoal for drainage and press the soil firmly into the pot. In due time another shift into 7 or 8-inch pots will be required and these, as a rule, will be sufficiently large for them to bloom in. In the Hills during winter, a low pit or frame is the best structure in which to grow them, standing the pots on a layer of ashes, which must be kept continually moist so as to do away with the necessity of too much watering ; as the sun gains power in spring, a northern exposure will be necessary, or they must be shaded ; if continued in a position where the sun will shine directly on them, inattention at this particular period to this matter will render all previous care more or less nugatory. And so also when the plants come into flower, a position away from the direct rays of the sun should be, if at all possible, secured for them.

CALENDULA. Pot Marigold. Nat. Order, *Compositæ*.

This genus is quite distinct from the plants generally known in this country as Marigolds (*Tagetes patula* and *T. erecta*). Some of the new varieties are exceedingly handsome, with large beautifully striped orange and brown, orange or yellow flowers. The seed must be sown in the spot where it is intended the plants should remain, as it is almost impossible to transplant them without injury. If imported seed is obtained, it should not be put in the ground before the latter and



CALENDULA OFFICINALIS METEOR.

of October, otherwise the plants raised are almost certain to damp off ; nor should they be grown in too rich a soil as they are then apt to become straggling. Sow in the Hills in April. During the past few years several very fine new varieties have been introduced amongst which the following are recommended :

CALENDULA, OFFICINALIS METEOR.—A fine double variety with light orange striped flowers.

CALENDULA, PRINCE OF ORANGE.—Similar to the preceding but of a much deeper colour.

CALENDULA, LE PROUST.—A new variety with large very double flowers of a bright naukeen yellow.

CALENDULA, PONGEII FL. PL.—A fine new white double flowered variety.

CALLIOPSIS Nat. Order, *Compositæ*.



COREOPSIS MARMORATA.

A very handsome group of showy annuals that well deserve a place in every garden. Sow the seed with other annuals in October, and put the plants, when two or three inches high, in good, rich soil. From the brilliancy of their flowers and long duration in bloom, they are especially adapted to our gardens. If the seed vessels are picked off as soon as they show themselves, the plants may be kept in bloom through the whole of the hot season.

COREOPSIS BICOLOR.—Bright yellow, crimson centre.

COREOPSIS CARDAMINIFOLIA.—Of erect pyramidal habit, bright orange.

COREOPSIS CORONATA.—A showy variety, with large yellow spotted flowers.

DRUMMONDII.—Large yellow flowers produced in abundance.

COREOPSIS HYBRIDA ATRONANGUINEA.—deep blood red.

HYBRIDA FLORE PLENO.—A new variety with semi-double flowers; very pretty.

NIGRA SPECIOSA.—Dark crimson.

MARMORATA.—A tall variety, with flowers curiously marbled and striped.

COREOPSIS SPLENDENS—Golden yellow, brown centre.

CALLIRHOE, Nat. Order, *Malvaceæ*.

A very pretty little annual that thrives well in our gardens, and produces continuously for months in the greatest profusion its small pink, white or rose-colored flowers. Sow the seed in October, and put the plants three or four in a patch in the border. Varieties—

C. macrorrhiza.

C. digitata

C. pedata.

C. pedata nana.

C. pedata nana compacta.

C. involucrata.

CALLISTEPHUS HORTENSIS, See *Asters*.CAMPANULA. Nat. Order, *Campanulaceæ*.

A very extensive family, mostly perennials some of them exceedingly beautiful, in the plains plants are most easily raised from seed sown in September or October and a small percentage may be induced to bloom the first season, *Campbellia medium* and *C. medium Calycanthemum* are best suited for the plains. In the Hills the whole of this family grow to perfection, in fact several indigenous species of considerable beauty are found in the Himalayas at an elevation of 5,000 to 9,000 feet. Seed should be sown in March or April and if the plants are liberally treated will flower profusely the following spring.

CAMPANULA MEDIUM.

CANDYTUFT. Nat. Order, *Cruciferae*.

A very popular annual in this country, the old white variety, *I. Amara*, being perhaps more extensively grown than any other annual amongst us; it never fails to produce its pure white trusses of bloom in the greatest profusion, and when grown in large clumps or patches is a very attractive object. During the past few years many new varieties have been introduced, some of which bear flowers of the most brilliant colours. These, however, although the plants thrive vigorously enough, rarely bloom satisfactorily in Lower Bengal. In the



CANDYTUFT, DORBIE'S SPIRAL.

North-West Provinces, Punjab and in the Hills these however flower as profusely as the older varieties and should certainly be found in every garden. Seed should be sown early in October in the place where the plants are to remain; they require a good rich soil and a liberal supply of water; occasional dressings of weak liquid manure will much increase the vigour of the plants.

Sow in April in the Hills, the following are all beautiful varieties.

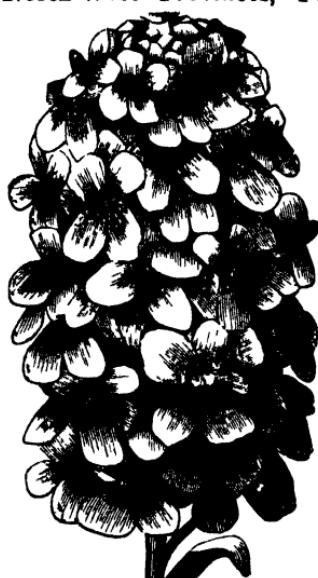
CANDYTUFT, ROCKET.—Bears long spikes of white flowers.

CANDYTUFT, DOBBIE'S NEW SPIRAL.—A splendid new variety, flowers pure white, extra fine spikes.

CANDYTUFT, EMPRESS.—A most beautiful Candytuft bearing a series of candelabra-shaped branches, each producing a large truss of pure white flowers, thus presenting a perfect pyramid of bloom throughout the season.

CANDYTUFT, CARTER'S CARMINE.—A beautiful variety producing dense trusses of flowers of a bright shade of carmine.

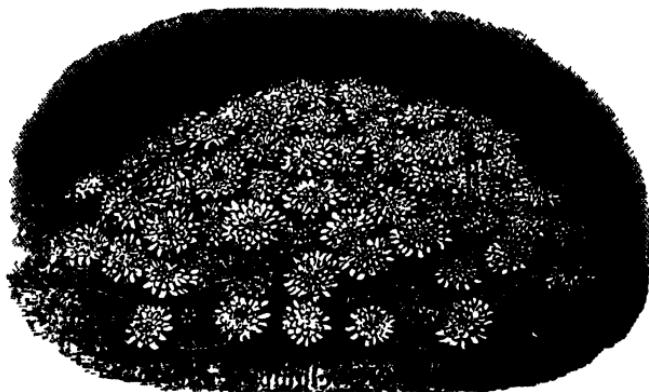
CANDYTUFT, DUNNETT'S CRIMSON.—A splendid variety with deep crimson flowers.



CANDYTUFT, EMPRESS

of flowers of a bright shade of carmine.

CANDYTUFT, DUNNETT'S CRIMSON.—A splendid variety with deep crimson flowers.



CANDYTUFT, SNOWBALL.

CANDYTUFT, SNOWBALL.—This is probably the finest variety of Candytuft yet introduced. It bears but little foliage and even this is entirely hidden by the enormous trusses of blooms which are frequently fully four inches in diameter and as round as a ball, the colour is of the purest white.

CALONYCTION. Nat. Order, *Convolvulaceæ*.

These are also known as Midnight Lilies, undoubtedly from the fact of the flowers not opening till after dark, and closing at dawn. Only two varieties are known in this country, namely, *C. muricatum* and *C. grandiflorum*, the former with pale purple flowers, and the latter with pure white flowers, both of which are extensive climbers, and require a strong trellis for their support. Seed should be sown in October in good rich soil in the place where the plants are intended to remain.



CANNA.

CANNA. Nat. Order.
Marantaceæ.

The Canna or Indian Shot is a well-known object in most gardens in this country, where it thrives with so much vigour as to become almost a weed. During the past few years an entirely distinct race has been introduced, the plants of which are exceedingly dwarf averaging in height from 18 to 24 inches only, these are also exceedingly floriferous and in many varieties the flowers are of great size, some of them being equally as large as the finest Gladioli and quite as brilliant in colour, they are admirably adapted for cultivation in pots and for this purpose when better known will certainly become

exceedingly popular. Seed may be sown at almost any season of the year, but to insure their germinating freely should be steeped in warm water for twenty four hours before sowing, or perhaps a better plan is to file off one side of the seed and sow at once, by either of these methods seeds will germinate in about 15 to 20 days, but if sown dry and intact will frequently lay in the soil for months without making any attempt at growth.

CARNATION.—(*Dianthus Caryophyllus*)Nat. Order, *Caryophyllaceæ*.

The Carnation is undoubtedly the most beautiful of the whole *Dianthus* family and is probably one of the most ancient of all cultivated flowers. The early history of the Carnation is shrouded in mystery there being no really authentic record extant whereby we may be enlightened as to when or by whom the improved species was first introduced, some assert that it is of English origin, and others that it owns Italy as the land of its birth. Possibly it may have been brought from the latter country by some jolly old monk who delighted in flowers as well as in good ale. However one thing is apparent, that the Carnation has lost none of its interest through age, but has been fostered and cultivated with an eye to improvement by each succeeding generation up to the present moment.

There are several distinguishable features which separate the Carnation into groups by which we have what is designated "Bizarres," "Flakes," "Picotees," and Self's or Cloves. Bizarres exhibit in their white petals irregular stripes and spots of two different shades of colour. Flakes are distinguished by being

composed of two colours,—the ground colour, and flakes of rose, scarlet or purple, Picotees are determined by having a margin or lacing around the petals. Solfs or cloves have only one colour, either white, scarlet, crimson, purple or other intermediate shades. Each division furnishes endless variety, for instance we have scarlet flake, pink flake, yellow flake &c., and the same rule is applied to describe Bizarres and Picotees,

PROPAGATION.

This is effected by seed for the production of new varieties, and when the object is to multiply approved kinds this is done by layers, pipings or grafting or what is better known in this country as *gootee*.

SEEDS.

In the plains sow about the middle of September in well drained pans in light porous soil, keep well shaded till germination takes place, put the seedlings into small pots when they have reached a size making them capable of being handled; re-pot as frequently as necessary taking care that they never become root bound. In the Hills sow by the end of August, treating them as described above, by December they should be in 4 inch pots in which they should be wintered, early in March transplant into 6 or 7 inch pots and most of them will bloom in July or August.

LAYERS.

The first part of August is generally the best time to perform this operation as the wood is then in a suitable condition to emit roots freely. Proceed by taking the shoots intended to form layers and cut away the lower leaves as shown in the illustration. Then insert a knife about half an inch below the third or fourth joint, and make an incision into the centre of the joint, directing the knife up the centre of the stem. Cut away the extreme end of the tongue thus formed by the insertion of the knife. The layer is next bent down to the ground and kept in position by means of a hooked peg, being careful that the incision is kept open



when fixed as the layers are pegged down, take care not to press them in the soil more than half an inch deep, keeping them regularly watered. By the first week of October the layers should be well rooted, and must then be taken off and potted singly in 4 inch pots.

PIPNINGS.

This method of propagation though formerly very popular, is now rarely adopted except where old plants have become so bushy and hard wooded as to prevent the branches being safely brought down to the soil level for layering, it is at best but an uncertain method even in experienced hands rarely more than 25 to 50 per cent. can be induced to root. A far better plan is shown in the next diagram for propagating from any branches or stems placed in any awkward position, this is very similar to the native method of propagating

known as *Gootee*, the stems are prepared and cut in precisely the same way as for layering, just below the incision a piece of Gutta percha or any other waterproof material is fixed as shown in the diagram, this is then filled with good rich soil lightly rammed in and carefully tied to a stake to prevent it getting out of position, during dry weather great care must be taken to keep these well watered, if properly cared for they will root quite as quickly as layers.



VARIETIES.

For culture in the Hills I would only recommend that seeds of first class quality should be sown, this is always expensive, but cheaper in the end than low price seed, as it will give a much larger percentage of doubles. In the plains sow only the new Margarita Carnation, this is one of the finest introductions of late years, and entirely distinct from any other, seed sown in October in the plains will bloom freely during the following February.



CELOSIA.—Cockscombs. Nat. Order, *Amarantaceæ*.

Certainly no Indian garden would be complete without this interesting annual, at least not in the opinion of our Hindoo *malees*, who look upon the *Moorgha* as one of the choicest plants we have. Like most other plants of the same genera, immense improvements have been effected in it by cultivation, and we now have a large number of varieties in almost every colour and of various forms and sizes, whereas a few years since the only variety seen in our gardens was the old *C. pyramidalis*. This is now entirely superseded by

the dwarf varieties, some of which produce combs of an immense size, frequently, it is stated, upwards of three feet in length and one and-a-half feet in breadth, though I have never seen any nearly approaching these dimensions in this country. Seed should be sown in pans from June to August in good, rich soil. As soon as strong enough, they should either be planted out in the open border, or potted off singly; liberally treated they will be in full bloom from October to December.

The following are the best varieties :

- C. *argentea*.
- C. *Huttoni*.
- C. *Japonica*.
- C. *President Thiers*.
- C. *Glasgow Prize*.
- C. *pyramidalis alba*.
- C. " *aurea*.
- C. " *coccinea*.
- C. *Reid's Perfection*



CENTAUREA CYANUS, NEW DOUBLE.

CENTAUREA. Nat. Order, *Compositæ*.

A large family of showy plants, most of which thrive to perfection in this country with but little care bestowed on their



CENTAUREA CANDIDISSIMA.

very popular, the flowers in appearance much resemble those of *Gaillardia picta Lorenziana* but are more diversified in colour.

Seed should be sown in October, and as soon as the plants are large enough should be planted out in good rich soil :—

Flowering Varieties.

- C. Americana.
- C. depressa.
- C. depressa rosea.
- C. macrocephala.
- C. cyanus.
- C. moschata.

Variegated Foliage.

- C. argentea.
- C. candidissima.
- C. Clementi.
- C. gymnocarpa.
- C. ragusina.
- C. rutifolia.

CENTRANTHUS. Nat. order, Valerianaceæ.

C. macrosiphon, or red Valerian, a very hardy annual which will thrive almost anywhere; grows to a height of about eighteen inches, and bears large bunches of dull-red flowers in great profusion. When well grown is a very showy plant. Sow the seed in October in pans and plant out when two or three inches high.

CHENOPODIUM. Nat. Order, Chenopodiaceæ.

Chenopodium Atriplicis Victoria.—A novel and very showy species known as 'Good King Henry' and is a fine ornamental foliage plant. The different colours of the leaves resemble Amaranthus and Coleus, and vary from pale yellow to deep crimson violet, pink, brilliant red, partially striped and shaded with light and dark green, the younger shoots and leaves being covered with a fine violet powder. The plants grow from $3\frac{1}{2}$ to $4\frac{1}{2}$ feet high, forming beautiful pyramidal bushes. Grown as specimens or in groups, it produces a striking effect, which increases under the influence of the sun. Sow in October.

cultivation. *C. moschata* or, Sweet Sultan, is a well-known old annual, which bears flowers, in various colours somewhat resembling those of the Thistle. *C. Clementi*, *Argentea*, and *gymnocarpa* are new varieties with ornamental foliage which make splendid bedding plants. *C. cyanus* is the well-known Blue Bottle or Cornflower of the English fields. A new double variety was introduced two or three years since, which in time will undoubtedly become

CHrysanthemum (Annual varieties). Nat. Order, *Compositæ*.

Chrysanthemum carinatum, with its numerous varieties, are exceedingly pretty annuals, but they are not so well-known or so generally grown as they deserve to be. All of them are most easy of cultivation in this country, and should certainly find a place in every garden. Plants may be raised from seed sown early in October, and if liberally treated will commence flowering in February, and keep up a constant succession of bloom all through the hot and rainy seasons if properly attended to.



CHrysanthemum CARINATUM, GOLDEN FEATHER.

The flowers have a great range of colour, and are of fine shape and substance, and with good cultivation measure 2 to $2\frac{1}{2}$ inches in diameter. They are very effective grown in pots, and invaluable for cutting.

GOLDEN FEATHER—This new variety is almost identical with the well-known *C. Burridgeanum* both in habit of plant and colour of flower, while the foliage is of a pleasing shade of yellow, rendering it very effective for lines or masses.

ALBUM, pure white with yellow centre.

ATROOCOCINEUM, scarlet.

BURRIDGEANUM, white, crimson and yellow.

CARINATUM (TRICOLOR), white and yellow.

LUTEUM, yellow.

THE SULTAN, velvety crimson or maroon.

W. E. GLADSTONE, rich crimson.

LORD BEACONSFIELD, crimson with yellow centre.

PURPLE QUEEN, the darkest of all, bright reddish purple.

ECLIPSE. Large, single flowers, 2 to $2\frac{1}{2}$ inches across, pure golden-yellow with a bright purplish-scarlet ring on the ray florets, the disc being dark brown.

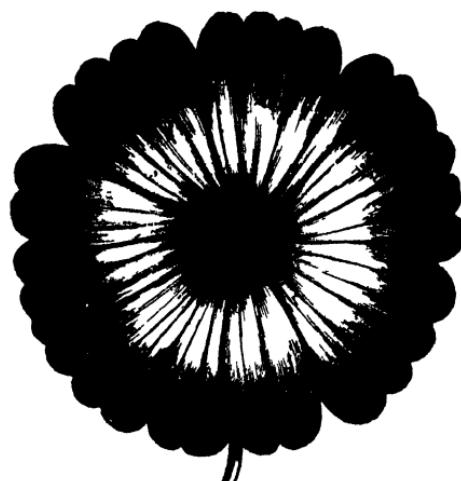
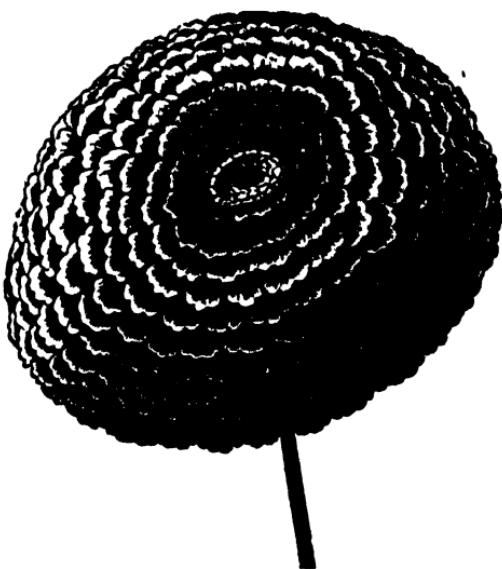
There are also now a large number of double varieties in cultivation the best of which are *C. Dunnettii* tricolor, *C. inodorum* plenissimum, *C. Coronarium* and *Chybirdum*.

THE CINERARIA.

Nat. Order, *Compositae*.

This is certainly one of the most beautiful of all the many plants classed as Florists' Flowers. Its cultivation, however, in the plains is attended with much difficulty even when the greatest care is bestowed on them, and yet they should certainly find a place in every collection; for if only half a dozen plants in a large batch of seedlings can be brought to bloom freely, the labour bestowed on them will be amply repaid. The plant, although of a perennial habit, can only be grown here as an annual. Seed should be sown about the middle of September, in pans filled with light, rich soil. As soon as the plants are large

enough to handle, they should be pricked out into small pots; they must then be placed in a light but shady situation under a frame or in a glass house if available. As soon as the pots they are in become well filled with roots, they must be shifted into a larger size for blooming. A pot of five or six inches diameter will be found sufficiently large for this purpose in this country, although in Europe it is customary to bloom them in eight, ten, or even twelve-inch pots.



This is, of course, where large specimens are required ; but with us, whose principal aim must be to induce the plants to flower at all, the smaller the size of the pots we grow them in the more likely are we to obtain the desired end, for, as in the case with many other plants, the fact of their becoming root-bound in the pots pre-disposes them to flower more freely.

The soil that suits them best is one of a free, open nature, and as rich as possible ; a compost of one-fourth each of leaf mould, very old cow manure, good friable loam and coarse sand suits them best. As soon as the plants commence growing freely, they should occasionally be treated to weak dressings of liquid manure. This may be continued up to the time of their commencing to flower, when it should be withheld and only pure water supplied.

One of the principal points in the cultivation of the Cineraria is to grow them in a light, moist and shady situation, where they are not exposed to the direct rays of the sun, otherwise they become stunted and sickly, and eventually die off.

The greatest drawback with us is, that the cold season here is not sufficiently long to bring the plants forward enough for flowering before the extreme heat kills them. To those having horticultural friends in our hill stations, there is a very easy remedy for this, and one which I have practised with success during the past three seasons, not only with the Cineraria but also the Primula and other plants. It is the custom there to raise seedlings from sowings made in August, these by the autumn form strong vigorous plants. If packed carefully they travel quite safely by post ; they should arrive by the end of October, and be put into their blooming pots at once. If liberally treated, they generally flower freely by February or March.

The double Cineraria is comparatively but a recent introduction amongst Florists' flowers, the first variety having been introduced about 1880 under the name of Mr. Thomas Lloyd. Since



CINERARIA, HYBRIDA GRANDIFLORA.

then numerous varieties have been raised, and now there are almost as many colours amongst double as amongst single Cinerarias. One advantage that the former possess over the latter is that the flowers last very much longer on the plant.

In our Hill stations, the Cineraria may be raised from seed in February for flowering the same season, or a better plan is to raise seedlings in August and keep them growing freely all through the winter, they will then commence flowering early in the spring and will keep up a succession of bloom for some months if potted at intervals; where a good strain of seedlings has been secured, they may be propagated from the offsets or side shoots, but these never make such vigorous plants as those raised from seed.

CLARKIA. Nat. Order, *Onagraceæ*.

Very hardy [annuals, most easily cultivated, and of an extremely floriferous habit; should be included in every collection.



CLARKIA ELEGANS.

- C. elegans.
- C. elegans, double.
- C. Mrs. Langtry.

- C. limbata.
- C. pulchella.
- C. Lord Beaconsfield.

CLIANTHUS. Nat. Order, *Leguminosæ*.

Clianthus Dampieri.—It is to be regretted that this plant, strikingly and uncommonly beautiful as it is, should be so seldom seen in anything like good condition. Its congener, *C. puniceus*, is handsome enough when well grown, but it cannot com-

pare with Dampieri, which when in good health, is probably one of the most striking flowering plants in cultivation. Many reasons have been assigned for the failure which, I may safely say, in most instances, attends the attempts to induce a luxuriant growth in *Cianthus Dampieri*, but the most reasonable explanation hitherto given, and one that my own experience confirms, is, that this plant has roots so extremely sensitive and delicate that the slight check they experience in the necessary operation of re-potting is alone sufficient to cripple and cause the premature death of the plant. Often have I seen the most promising seedlings go off in a sudden and unaccountable manner when re-potted. The moral of this is, that the seed should be sown in the pot in which the plant is intended to bloom, and then, I think, we should often see this fine plant in perfection. Sow seed early in October.

COBÆA. Nat. Order, *Polemoniaceæ*.

Cobæa Scandens is undoubtedly one of the most beautiful



however require to be protected from frost propagated by layers or from seed sown in April or May, these will produce blooming plants the following season.

creepers in cultivation, but can rarely be grown successfully in the plains ; seed may be sown in October and for the first few months will grow vigorously but as soon as the hot weather sets in the plants will almost invariably succumb ; with care they may occasionally be kept till the following cold season when they will again start into vigorous growth and flower freely in February or March. In the Hills, however, it has found a congenial home and will thrive in almost any position, and bloom continuously for months, at any elevation over 6,000 feet it will in winter, it is easily

CLINTONIA. Nat. Order, *Lobeliaceæ*.

A very handsome annual, in habit somewhat resembling the Lobelia ; is especially adapted for edgings or rockerries, for which it is very extensively used in Europe. Near Calcutta it does not thrive very satisfactorily in the open ground, but if carefully attended to, very fair specimens may be raised by growing them in pots. The seed being very minute should be mixed with sand before it is sown, the surface of the soil carefully pressed down, and covered with a sheet of glass and put in a shady position till germination commences. As soon as strong enough they should be transplanted into good, rich soil ; as the plants increase in size they are much benefited by being frequently transplanted or repotted. To produce good flowers it is necessary to keep the plants dwarf by continually pinching back the leading shoots, and an occasional dose of weak liquid manure will materially benefit them.

COLEUS. Nat. Order, *Labiatae*.

These beautiful Ornamental Foliated plants are so well known all over India as to need no description here. New varieties are easily raised from seed which may be sown at almost any season of the year. The seed is very minute and requires to be sown with care, the method recommended for Calceolaria, I have found to answer admirably. In the Hills at any elevation over 5,000 feet the Coleus can only be grown successfully under glass, and during winter will require artificial heat to keep them healthy.

COLLINSIA. Nat. Order, *Scrophulariaceæ*.

A well known old annual which requires but little care in its cultivation, and thrives well in our gardens. Should be treated in the same manner as recommended for Calceolaria. The best varieties are *C. tricolor*, *bicolor alba* and *grandiflora*.

COLLOMIA. Nat. Order, *Polemoniaceæ*.

This is but rarely found in our gardens although much grown in England, where it

is a popular favorite. Seed may be sown early in October in pans, and the plants put out, when they are two or three inches high, in good, rich soil. They will commence flowering in February, and continue blooming freely for three or four months. Varieties — *C. coccinea* with pale red flowers, and *C. grandiflora* with salmon-coloured flowers.



COLLOMIA BICOLOR.

CONVOLVULUS. Nat. Order, *Convolvulaceæ*.

Probably there is hardly a more popular class of annuals than that of the *Convolvulus*. In England it is almost invariably found in every garden, no matter whether that of the humble cottager or in the surroundings of the lordly mansion. In this country the climbing varieties grow to the greatest perfection; the dwarf varieties, although they grow freely enough, are extremely shy of flowering.



CONVOLVULUS MAJOR.

of the whole family, of a very vigorous in any situation or soil, the flowers also being of nearly every shade of colour, and many of which are fantastically edged or striated with white.

C. minor.—This attractive annual can rarely be brought to bloom with much success in Bengal. Seed may be sown with other annuals in October in good, rich soil; the plants will grow freely enough through the whole of the cold season till March, when they will occasionally put forth a few straggling flowers, but more frequently they continue growing till the hot season sets in, when they die off without bearing a single flower.

In the Upper Provinces, however, it produces its flowers in endless profusion.

C. major or *Ipomea purpurea*, also known as Morning Glory, is undoubtedly the most attractive section

habit, and growing almost



CONVOLVULUS MINOR.

(For other varieties, see *Ipomea*.)

COLUMBINE see *AQUILEGIA*.

COREOPSIS, see *CALLIOPSIS*.

CORNFLOWER, see *CENTAUREA*.

COSMEA. Nat Order, *Compositæ*.

Cosmea bipinnata, a very pretty annual with pale pink flowers; should be cultivated under the same treatment as recommended for *Calliopsis*.

CUPHEA. Nat. Order, *Lythraceæ*.

A small family of very profuse blooming plants, most of which are of a perennial nature, although, in this country, they can only be successfully grown as annuals. Sow the seed in October or November in the place where the plants are to remain; they will be in full bloom in from four to five weeks from the time of sowing, and if left undisturbed, they will replenish themselves freely from self-sown seed through the whole of the cold season.

DATURA. Nat. Order, *Solanaceæ*.

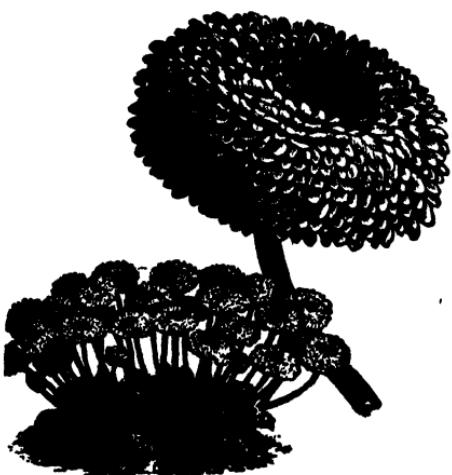
A large and rather coarse growing family of annuals, nearly all of which grow to perfection in Bengal. Seed should be sown early in July, and as soon as the plants are five or six inches high should be planted out in good rich soil.

D. alba is an indigenous variety, bearing very handsome, large, white flowers, found growing wild in most parts of Bengal, consequently is rarely considered worthy of a place in our gardens. Amongst the cultivated varieties *D. Wrightii* is a very showy species with delicate blue and white shaded flowers. *D. chlorantha* has magnificent golden yellow flowers, perfectly double and very sweet scented. *D. atroviridiflora* with double flowers of a rich violet colour on the outside and pale lavender within. The *D. fastuosa* varieties, with their large double flowers, are perhaps the best adapted for our gardens, being more compact in habit and free flowering than most of the others.

DAISY. (*Bellis Perennis*)

Nat. Order, *Asteraceæ*.

Daisies certainly rank amongst the most popular of garden flowers, being of extremely easy culture and at the same time very ornamental, seed should be



DAISY, SNOWBALL.

sown early in October and as soon as the plants have made three or four leaves they should be planted out either in pots or boxes

or, if preferred, in beds. The new Longfellow and Snowball are charming varieties, very double and much larger than the older kinds.



DELPHINIUM HYBRIDA.

they will bloom freely the following spring.

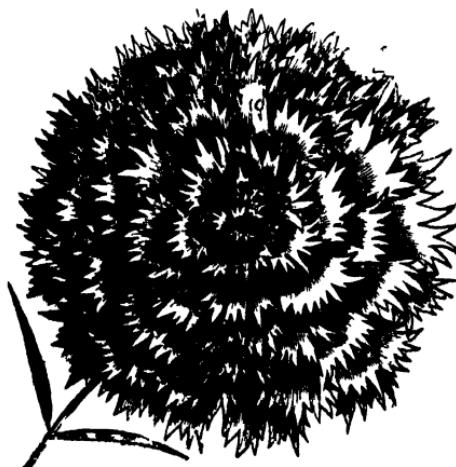
DELPHINIUM. Nat. Order,
Ranunculaceæ.

The Delphiniums or perennial Larkspurs can rarely be grown with any measure of success in the plains, in the Hills, however they thrive admirably. Seed should be sown in April, and if the plants are liberally treated,

DIANTHUS. Nat. Order, *Caryophyllaceæ.*

The annual varieties of Dianthus, nearly all of which have descended from *D. Chinensis* are undoubtedly amongst the most

beautiful annuals we possess in this country, they are all of extremely easy culture and will grow in almost any soil either in the open ground or in pots, though of course like every thing else will amply repay good treatment. In the plains, the seed should be sown early in October and as soon as the seedlings are large enough to handle they should be planted out placing them ten to twelve inches apart each way, for growing in pots one plant in a 6 inch, or 3 plants in a 9 inch pot will be suffi-



DIANTHUS, LACINIATUS FLORE PLENO.

cient, as soon as the flower buds are formed a weak dose of liquid

manure should be given every ten days, and where extra large blooms are required of the *diadematus* or *laciiniatus* sections only one flower should be allowed to remain on each stem. Care should be taken to remove all flowers as soon as they are faded as by so doing the plants will continue to produce a succession of blossom for months, but if once seed pods are allowed to form the plants can rarely be induced to bloom

satisfactorily. In the Hills sowings may be made in April, and if properly grown will flower freely the first season, and if care is taken to remove all withered flowers they may be kept through the winter and will flower again profusely in the spring.

DIANTHUS CHINENSIS FLORE PLENO.—(Double Indian Pink,) producing flowers of every shade of colour from pure white to deepest purple, fantastically blotched and marbled.

DIANTHUS CHINENSIS NANUS FLORE PLENO.—A very dwarf variety of the preceding, plants rarely attain a height of more than 6 to 8 inches, well adapting for bedding.

DIANTHUS HEDDEWIGI DIADEMETUS FLORE PLENO.—The colours embrace all the various tints of lilac, crimson, purple, and maroon, the fringed edges of the petals being pure white and blush, which tends to brighten the whole appearance of the flower and makes it truly characterised by its name. “*The Diadem Pink.*”

DIANTHUS HEDDEWIGI.—Single flowered, blooms 3 to 4 inches in diameter.

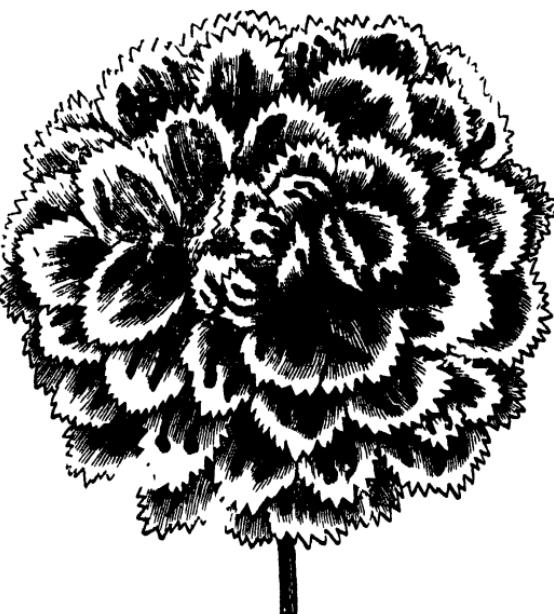
DIANTHUS HEDDEWIGI LACINIATUS STRIATUS FLORE PLENO.—A fine large-flowering double variety of the favourite *Dianthus laciiniatus*. The white blossoms elegantly striped with different shades, which vary from the most delicate rose to the deepest red.

DIANTHUS EASTERN QUEEN.—A very splendid single variety with very large bright rose flowers.

DIANTHUS CRIMSON BELLE.—Closely resembling the preceding, but the flowers are of a deep glowing crimson.

DIANTHUS MOURNING CLOAK.—A splendid novelty, flowers very double, of a rich black purple, edged white.

DIANTHUS HEDDEWIGI FLORE PLENO.—A splendid strain producing



DIANTHUS, DIADEMETUS, FLORE PLENO.



DIANTHUS MOURNING CLOAK.

DIGITALIS. Nat. Order, *Scrophulariaceæ*

2

The Digitalis or Foxglove cannot I believe be grown with any degree of success in the plains, plants are easily raised from seed but invariably die off on the first approach of hot weather. Last season I sent down a few plants to a very ardent gardener in Behar, and these flowered well in March, there is no doubt if plants were procured from any of our Hill stations in October there would then be no difficulty in flowering them provided the plants obtained had been raised from seed the previous spring. In the Hills every variety grows splendidly, seed should be sown in the spring, these will flower the following year.

ERYSIMUM. Nat. Order,
Cruciferae.

A small group of annuals occasionally seen in our gardens, where they will thrive, but with

immense flowers in almost every shade of colour from white to deep purple.

DIANTHUS IMPERIALIS.—Double Imperial Pink, produces very double large flowers of every shade of colour.

DIANTHUS HYBRIDUS FLORE PLENO.—Very large flowering, intensely double, a distinct and very beautiful class.

DIANTHUS HYBRIDUS NANUS FLORE PLENO.—Flowers the same as preceding, but of very dwarf habit, plants rarely attaining a height of more than six or eight inches.



DIGITALIS OR FOX GLOVE.

little care bestowed on them. Seed should be sown in October in the border, where the plants are to remain. *E. Perofskianum*, or Yellow Stock, bears deep orange coloured flowers. *E. Arkansanum*, with pale yellow flowers. *E. barbarea variegatum*, a new variety, with rather prettily marked foliage; when well grown makes an effective bedding plant.

ESCHCHOLTZIA. Nat. Order, *Papaveraceæ*.

This genus, which is also known as the Californian Poppy includes many brilliantly colored varieties, all of which, when well grown, are extremely attractive. Seed should be sown in the open ground in October where the plants are to remain, as they do not bear transplanting well. There are now an immense number of varieties. The best of the new ones being undoubtedly, *E. mandarin*, which is one of the most gorgeously colored annuals in cultivation, the inner side of the petals being of a bright orange color, and the outer of a beautiful crimson scar-



ESCHHOLTZIA MANDARIN.

let. The following list embraces the best varieties in cultivation:—

ESCHHOLTZIA CALIFORNICA—A handsome variety with hoary green much divided foliage, bears a profusion of large expanded bright yellow flowers.

ESCHHOLTZIA MANDARIN.—A new and distinct variety; the outer side of the petals of a most brilliant orange crimson, the inner side rich orange; very showy.

ESCHHOLTZIA CARMINEA GRANDIFLORA.—A charming variety of this deservedly popular section, with large flowers of an intense carmine rose. It is perfectly distinct and much superior in every respect to the well-known

H. Rosea. In habit of growth, foliage, and size of flower, this novelty is the counterpart of the *H. Mandarin*, and like it blooms freely until late in the season.

ESCHCHOLTZIA CROCEA FLORE PLENO.—Fine orange colour, producing a large proportion of double flowers.

EUCHARIDIUM. Nat. Order, *Onagraceæ*.

A showy old annual, but rarely seen in cultivation in our Indian gardens. It should be grown under the same treatment as recommended for the Clarkia, which plant it closely resembles. Varieties—*E. Concinnum*, *E. Grandiflorum*, and *E. grandiflorum album*.

EUTOCA. Nat. Order, *Boraginaceæ*.

A small group of handsome flowering plants, extremely simple in their cultivation; deserves a place in every garden. Seed should be sown in October in the place where they are to remain. Varieties—*E. multiflora*, *E. viscosa* and *E. viscosa alba striata*.

FENZLIA. Nat. Order, *Polemoniaceæ*.

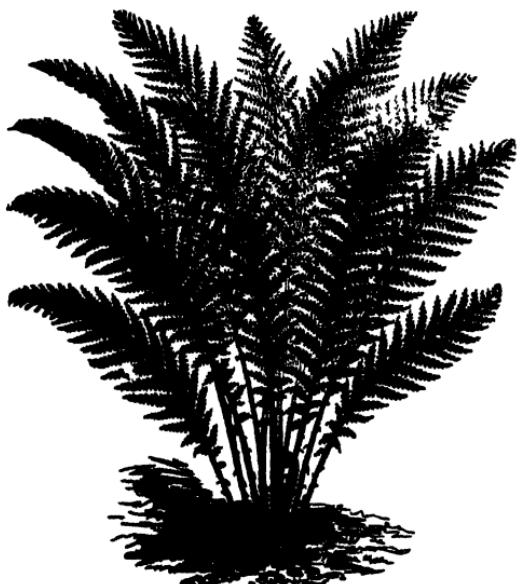
Fenzlia dianthiflora, a very pretty little annual, especially adapted for rockeries and edgings growing to a height of three or four inches only, the plants becoming almost entirely covered with its small pink flowers. The seed should be sown early in October in good, rich soil on the spot where the plants are to remain.

FERNS. Nat. Order, *Polypodiaceæ*.

It is not my intention here to describe Fern culture in detail,

for in a work of this kind it would be out of place. The question however of "How to raise Ferns from spores or seeds" is so often asked that I believe a few hints on the subject will prove interesting to many.

To ensure success in raising Ferns from spores it is of the first importance that the fertile fronds should be collected at the proper time, and they should always be selected from plants grown in isolated positions as far as possible; as, where several



sorts come in contact with one another, the spores, which float about freely, will often settle on the fronds of different sorts, and it becomes difficult to ensure a crop of the particular kind that is desired. *Nephrodium molle*, *Pteris longifolia*, and some of the *Gymnogrammas*, are among the most troublesome Fern-weeds, and should never be allowed to come in contact with those that are required to be increased. The best time to collect the fertile fronds is just as the spore-cases begin to open ; as soon as the fronds are taken off they should be folded up in paper, and if put in a warm, dry place, in a few days there will be plenty of spores ready for sowing ; or they will keep in good condition for a very long period. As good fertile fronds of many sorts are only to be had at certain seasons, it is necessary to be on the look-out so as to secure them when they are obtainable, bearing in mind that it is better to have a little extra stock, rather than to run short of any particular sort.

SOWING THE SPORES.

The plan I adopt is somewhat different to that which is usually advocated—viz., I usually use 6 inch pots, which are filled firmly to within about an inch of the top with good loam, using no drainage whatever, and after the pots are filled they are thoroughly watered. Before sowing the spores, I sprinkle a little soorkee over the surface of the soil, or potsherds powdered fine and sifted through a fine sieve. As soon as the spores are sown, each pot is covered with a piece of glass and stood in a saucer of water ; the saucers are not kept constantly filled with water, but sufficient is given to prevent the pots requiring any surface watering ; the pots are placed in a warm shady corner in a glass house where they remain until the spores begin to germinate, they are then removed to a lighter position, and the glasses are taken off every morning until the prothallia are well developed, when the glasses may be dispensed with altogether. As soon as they are sufficiently developed I prick them off into pots or boxes, the compost for which consists of equal parts of loam and leafmould with a liberal allowance of sand added ; plenty of drainage is also used.

Ferns, when pricked off in a small state, must be lifted and replanted in patches, and these require dividing again when potted off into small pots, though in some cases they are not divided singly, as when grown in tufts of three or four together they are more useful, and are useful much sooner ; this especially applies to *Adiantums* of different kinds, *Pteris serrulata* and its varieties, *P. hastata*, *P. cretica* and its varieties ; while such sorts as *P. tricolor*, *P. argyrea*, *P. tremula*, *Cyrtomium falcatum*, or any of the *Gymnogrammas*, are better grown singly.

FORGET ME NOT. see *Myosotis*.

GAILLARDIA. Nat. Order, *Compositæ*

Nearly all the members of this extensive family, although freely flowering the first year from seed, are of a perennial nature. In this country, however, we can only grow them as annuals, and they certainly as such should be found in every collection, for they are not only exceedingly brilliant and varied in the color of their flowers, but with proper care they may be depended on to retain their beauty for a very long period. Seed may be sown in pans at the end of September, and



GAILLARDIA LORENZIANA.

the plants should be put out as soon as they are strong enough in any good soil. The following are the most popular varieties:—

GAILLARDIA AMBLYODON.—Flowers bright crimson with black crimson centre, very showy.

GAILLARDIA HYBRIDA GRANDIFLORA.—Flowers bright crimson and yellow; very showy and free flowering.

GAILLARDIA PICTA NANA.—A very fine variety of compact habit. The flowers, which are of large size, are of a reddish crimson colour, bordered with yellow.

GAILLARDIA PICTA LORENZIANA.—A variety of recent introduction, producing large heads of double flowers in various brilliant colours.

GILIA. Nat. Order, *Polemoniaceæ*.

These are closely allied to *Phlox Drummondi*, which plant some of the varieties very much resemble. Sow the seeds in pans in October, and plant out when about two inches high.

GLOBE AMARANTH. *see Gomphrena Globosa*.

GODETIA. Nat. Order, *Onagraceæ*.

A comparatively new family of very



GODETIA LADY ALBEMARLE.

handsome annuals that have become extremely popular, during the past few years, many new varieties of sterling merit having been introduced. All of these thrive extremely well here, and are well deserving of cultivation. *G. Whitneyi*, and its many varieties, are the largest flowered, the blooms of which frequently measure upwards of four inches across, of very delicate shades of color. *G. Lady Albemarle* is of a very gorgeous hue, the flowers being of a most brilliant fiery crimson. Seed should be sown early in

October, and the plants put out when strong enough at a distance of about twelve inches apart. They require a light very rich soil, and an abundant supply of water. Frequent dressings of weak liquid manure will much improve the size of the flowers. Varieties—

GODETIA BIJOU. The dwarfest variety, very bushy plants, covered with pure white flowers marked with a dark rose spot.

GODETIA DUCHESS OF ALBANY.—Flowers of a beautiful satiny white, each when fully expanded measuring about 4 inches across.

GODETIA LADY ALBEMARLE.—Flowers of an intense carmine crimson, shaded towards the edge of petals with a delicate lilac tint.

GODETIA LADY SATIN ROSE.—A lovely variety, the flowers are of a beautiful deep rose pink, the surface shining like satin. It is one of the most beautiful varieties yet raised.

GODETIA PRINCESS OF WALES.—Ruby crimson pencilled with pale rose and silver grey.

GODETIA THE BRIDE.—Pearly white flower with carmine margin.

GODETIA WHITNEYI ATROSANGUINEA.—Carmine and rose coloured flowers, very bright and attractive.

GODETIA WHITNEYI BRILLIANT.—A highly effective variety with brilliant crimson flowers.

GODETIA WHITNEYI COMPACTA.—A very handsome dwarf variety of the preceding, plants form dense bushes covered with bloom.

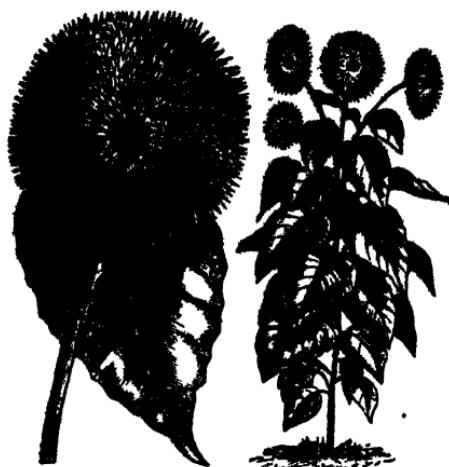


GOMPHRENA GLOBOSA. Nat. Order, *Amarantaceæ*

This is also known as Globe Amaranth, or Bachelor's Buttons, a very popular old favorite and almost invariably found in every Indian garden, where if left undisturbed the plants will frequently remain for years. It is, however, advisable to renew them yearly from seed, as the flowers on old plants are generally very inferior both in point of size and brilliancy of colour. Seed may be sown in June or July in pans in a sheltered situation. As soon as the plants are two or three inches high they should be planted out; they will grow in almost any soil, though one of a light, rich nature suits them best.

GYPSOPHILA Nat. Order, *Caryophyllaceæ*

A small genus of hardy plants principally used in England for rockeries, most of the varieties are natives either of Siberia or the Crimea, so that it is hardly probable any of them could be cultivated with success here.



HELIANTHUS, GLOBOSUS FISTULOSUS.

HELIANTHUS, NANUS FOLIS VARIEGATIS.—Green and variegated foliage; very ornamental.

HELIANTHUS, OSCAR WILDE.—A new single variety; flowers medium size with bright yellow petals changing to brown at the base.

HELIANTHUS, RUSSIAN GIANT.—Flowers, 18 to 20 inches in diameter, grown principally for the seed, of which it is very prolific.

HELIANTHUS, SULPHUR GEM.—A new variety, entirely distinct in colour, the flowers being of a pale sulphur yellow.

DOUBLE VARIETIES.

HELIANTHUS, CALIFORNICUS, FLORE PLENO.—Extra double bright golden yellow.

HELIANTHUS, GLOBOSUS FISTULOSUS.—Flowers of a globular outline 12 to 18 inches in diameter, of a rich saffron yellow, the best of all the doubles. (See illustration.)

HELIANTHUS, NANUS, FLORE PLENO.—Fine dwarf variety, flowers small.



HELECHRYSUM ANGUSTIPOLIUM.

HELIANTHUS, Sunflower.

Nat. Order, *Asteraceae*.

This familiar old annual is so well known throughout India that it is hardly necessary to mention it here. Some of the newer varieties are extremely showy, and are very ornamental objects in any garden having sufficient space to grow them. Seed should be sown from May to July and the plants put out when they are about six inches high, the following are the best of the newer kinds:—

HELICHRYSUM. Nat. Order, *Composita*.

One of the largest groups of Everlasting flowers, nearly all the varieties of which grow very freely in this country. Seed should be sown in pans in October, and the plants put out into the border when they are two or three inches high ; they require a good rich soil. Sow in the Hills in April.

HIBISCUS Nat. Order,
Malvaceæ.

The few annual varieties of this family, such as *H. Africanus* and *giganteus*, are extremely easy of cultivation. Seed should be sown in a sheltered situation in July, and as soon as they are large enough, put out in the open border. They require a well drained, light rich sandy soil. The best varieties are *H. africanus* with pale buff-flowers, with a violet eye, *H. giganteus* with large pale yellow flowers, and *H. Lindleyi* with deep crimson flowers.

HELIOTROPE OR CHERRY PIE. Nat. Order, *Boraginaceæ*.

The Heliotrope is undoubtedly one of the most popular plants in cultivation, it may be propagated by cuttings or layers and from seed. For the plains the latter is undoubtedly preferable as seedlings when properly grown invariably produce much finer blooms than those raised from cuttings. To insure plants blooming the first season, seed should be sown in August or September, as soon as the seedlings are about two inches high they should be put at once into 10 or 12 inch pots. See that they are kept liberally supplied with water, and occasional doses of liquid manure,



HELICHRYSUM MONSTROSUM.



HELIOTROPE.

to insure plants of good shape they should be stopped when about 6 inches high, this will induce them to throw out laterals, which should again be stopped at the third or fourth leaf. By the first week in January stopping should be discontinued and they will then bloom freely in February and March. In the Hills seed may be sown in April and the plants should be treated as described above, cuttings from old plants also will root freely if put in early in the spring.

HOLLYHOCK (*ALTHEA ROSEA*.) Nat. Ord., *Malvaceæ*.

The Hollyhock, a native of China was first introduced into European gardens upwards of 300 years ago, but it is not till within comparatively recent years that such vast improvements have been effected in their flowers, for it is well within my recollection when the blooms produced from seedlings were nothing better than broad discs of red, yellow or white and other intermediate hues, crowned by a tuft of stamens, whereas now seedlings raised from any good strain will usually produce from 40 to 60 per cent. of good double flowered varieties. In the plains the only method of propagation must be from seed, this should be sown as early as possible in boxes or pans under shelter, keeping them carefully shaded from the sun until the seed leaf is fully expanded. When the seedlings can be easily handled, they should be planted singly into 6 inch pots, and as soon as they are 6 to 8 inches high may be planted in the beds or borders where they are to remain. Water copiously at the root in dry weather, after they are well established and in active growth give liquid manure regularly. It must be borne in mind that this plant is naturally a perennial, and that to induce it to flower the first season it must necessarily require liberal treatment.



HOLLYHOCK.

In the Hills where good double varieties have been once raised they may be propagated from cuttings from the numerous side shoots that spring up so freely round the base of each plant, these should be taken off as early as possible and planted singly in 6 inch pots, in a month or two they will make good strong plants and if space is available may be planted out.



HUMULUS JAPONICUS

HUMULUS. Nat. Ord. *Cannabinaceæ.*

Humulus Japonicus a new variety of Annual Hop from Japan is certainly one of the finest creepers that has been introduced for many years, it does well in any soil and at almost all seasons provided it receives a liberal supply of moisture, I have seen plants climbing a distance of 15 to 20 feet within three to four months after sowing the seed.

IMPATIENS. Nat. Order, *Balsaminaceæ.*

Impatiens Sultanii is entirely distinct from any other Balsam in cultivation, it is of a compact neat habit of growth, with good constitution and almost a perpetual bloomer. The flowers are of a brilliant rosy scarlet colour, and are produced so freely that a well grown specimen appears to be quite a ball of flower, and continues in full beauty during several successive months.

IPOMEA. Nat. Order, *Convolvulaceæ.*

A very extensive family, all its members, being of a scandent habit. A few of them are annuals, but the majority are perennials. The annual varieties include several very handsome species, all of



IMPATIENS SULTANI.

which will thrive very well in this country if grown under the same treatment as required for *Convolvulus major*. Varieties—

IPOMEA BONA MOX, beautiful large violet flowers.

IPOMEA HEDERACEA, large fragrant flowers, very handsome.

IPOMEA GRANDIFLORA, large pure white fragrant flowers borne in great profusion, opens in the evening. (The Moon flower.)

IPOMEA LEARI "BLUE DAWN FLOWER") intensely bright blue.

IPOMEA RUBRO CERULEA, a well-known beautiful variety.

IPOMOPSIS. Nat. Order, *Polemoniaceæ*.

This although naturally a biennial, will flower freely the first



THE MOON FLOWER. IPOMEA GRANDIFLORA.

year if seed is sown early, and the plants liberally treated. Sowings should be made in pans early in September, and the plants put out at the expiration of the rainy season. They require a good rich soil with a liberal dressing of manure added. After flowering, the seed-pods should be carefully removed, when the plants can be kept over to the following season if placed in a sheltered situation. The trouble taken will be amply repaid, as the plants will then bloom much more freely than those just raised from seed.

KAULFUSIA. Nat. Order, *Compositæ*.

Kaulfusia amelliodies is one of the most useful hardy annuals we possess; bears in the greatest profusion pretty daisy-like flowers either blue, rose, scarlet, violet or white. Grows freely in the open ground and makes a very neat edging or border plant. Seed should be sown in pans at the same time as the other annuals and planted out in good rich soil, when two or three inches high.

LARKSPUR, *Delphinium*. Nat. Order, *Ranunculaceæ*.

One of the most popular of English garden flowers, and with proper care most of them can be grown very successfully in this country. During the past few years an immense improvement has been effected in them, and we now have several classes varying in height from 12 inches to three feet, and in a large variety of colours. A general complaint amongst gardeners in this country is that imported seed can rarely be induced to germinate. This is in nearly every instance owing to the fact of its being sown too early ; if it is kept over till the middle of November, and then sown in good rich soil, it very rarely fails. If liberally treated the plants will flower freely in about three months from the time of sowing. If a good strain is once procured care should be taken to save seed yearly, as acclimatised seed will always germinate earlier and much more freely than that imported, and it is one of the few plants that do not deteriorate to any noticeable extent in this country.



LARKSPUR, HYACINTH FLOWERED

LARKSPUR, DWARF GERMAN ROCKET.—Of very dwarf habit, flowers very large, extra double.

IMPROVED, HYACINTH FLOWERED LARKSPUR.—A splendid new strain ; flowers large and brilliant in colour, borne on immense trusses.

LARKSPUR, TALL DOUBLE ROCKET.—Plants attain a height of 2 feet ; flowers very double and brilliant in colour.

LARKSPUR, CANDELABRA-FORMED.—The best of the many new forms of this useful family ; plants about a foot in height and the same in diameter ; flowers very large and perfectly double.

LARKSPUR, EMPEROR.—A magnificent class, of symmetrical bushy habit ; single plants frequently producing upwards of 50 spikes.

LARKSPUR, BISMARCK.—Similar in habit to the Candelabra varieties, but of much more vigorous growth and larger flowers.

LATHYRUS ODORATUS.—See Sweet Pea.

LEPTOSIPHON. Nat. Order, *Polemoniaceæ*.

A very useful group of hardy annuals of comparatively recent introduction. Most of the varieties are very dwarf in habit and are extensively grown in Europe for edgings and rockwork. Sow the seed at the same time as the other annuals, and put out in the border when about two inches high. It is advisable to grow several plants together in a clump; they form then a



LEPTOSIPHON.

very attractive object; they require a light rich soil. Varieties—

L. *densiflorus*.

L. *luteus aureus*.

L. " *alba*.

L. *multiflorus*.

L. *luteus*.

L. *roseus*.

LIMNANTHES. Nat. Order, *Tropaeolaceæ*.

A small group of hardy annuals, most of them of a trailing habit; bears insignificant white or yellow flowers. Seed should be sown at the same time as the other annuals,—hardly deserving a place in the garden

LUNARIA. Nat. Order, *Scrophulariaceæ*.

A very effective annual when grown in large beds or masses and most easy of cultivation; should certainly find a place in every collection. Seed should be sown in October in the place where they are to remain, as the plants will not bear transplanting well. There are now several varieties, all very similar in habit, and differing only in the colour of their flowers. The following are the best:

L. *Bipartita alba*, white,

L. *Bipartita splendida*, purple.

L. *Maroccana*, plum colour.

L. *tristis*, yellow and white.



LINUM GRANDIFLORUM RUBRUM.

LINUM. Nat. Order, *Linaceæ*.

A very popular class of annuals, some of them of great beauty. *L. grandiflorum rubrum* is one of the most brilliantly coloured annuals we possess. They are all extremely hardy, and will

grow in almost any situation, though to produce them to perfection they require a good light soil to which a liberal supply of leaf mould or old manure has been added. Seed should be sown in October in the place where the plants are to remain, as if transplanted the flowers are never produced so freely as when the plants are raised in the border.

LOBELIA. Nat. Order, *Lobeliaceæ*.

A very large family of

annuals and perennials, some of them of great beauty, here, however all the varieties must be grown as annuals.

Seed should be sown early in October, in pots of light, rich soil. Before sowing it should be mixed with dry sand or ashes and then scattered evenly over the surface, covering only with a pane of glass till the plants are up. As soon as they are large enough to handle, prick them out into pans or pots about an inch apart. When about two inches high transplant again, putting three or four plants only into a six-inch pot, in which they will remain for flowering. It is impossible to make the soil too rich for

LOBELIA, MAZARIN GEM.

them. Firminger recommends a compost of "leaf mould, sand and well decomposed manure only." If grown in a moderately shaded situation, and kept liberally supplied with water, they will not only flower most profusely, but will retain their beauty for a long period.

There are now such an immense number of varieties that it would be impossible to give a complete list of all. The following selection, however, embraces the most beautiful of them :—

LOBELIA ERINUS ERECTA.—Bright blue, of a very compact dwarf habit, one of the best varieties for beds or borders.

LOBELIA ERINUS, CRYSTAL PALACE GEM.—A splendid variety, with dark blue flowers.

LOBELIA ERINUS PAXTONIANA.—Beautiful dark blue with clear white centre.

LOBELIA MAZARIN GEM.—A fine new variety of dwarf habit, flowers of a beautiful deep blue.

LOBELIA, PRIMA DONNA.—A very distinct colour being of a deep purple red.

LOBELIA CRYSTAL PALACE COMPACT.—This beautiful variety unites the deep blue colour of the true Crystal Palace sort with the compact habit of the *erecta* section, being of great value in ribbon bedding and for cultivation in pots.

LOBELIA ERINUS GLOW-WORM.—A most desirable variety, very dwarf, flowers of a rich dark blue.

LOBELIA ERINUS SPECIOSA.—A really fine strain, very compact, producing in great profusion large blue flowers with white centre.





LOPHOSPERMUM SCANDENS.

LOPHOSPERMUM,
Nat. Order *Scrophulariaceæ*.

LOPHOSPERMUM SCANDENS.—This is one of the most beautiful climbing annuals and is very easily grown. It has elegant, graceful flowers, of large size, resembling Fox-gloves in shape, and of a rich rosy purple color. The flowers are produced in rich profusion, while the foliage is also extremely beautiful.

LOASA, Nat. Order *Loasaceæ*.

Very handsome climbing plants, which although perennials, must be treated as annuals in this country, seed should be sown early in October, the plants as they advance in growth will require a small trellis for their support. The leaves of the plant are covered with short hairs which sting like nettles.

LUPINS, (*Lupinus*, Nat. Order, *Leguminosæ*).

All the members of this extensive family must be treated as annuals in the plains.

There are now an immense number of varieties all more or less beautiful. The only difficulty in their cultivation is to induce the seed to germinate, for when once the plants are well above ground they will require no further care beyond an occasional watering. The seeds of all the large growing varieties are very hard, and if sown in a dry state will frequently remain for months in the soil without germinating. It is therefore advisable to soak them in hot water (as hot as the hand can bear) for about



LUPIN, PRESIDENT CLEVELAND.

six hours before sowing. The seed must be sown in the place where the plants are to remain, as it is almost impossible to transplant them without injury. They will thrive in any good garden soil if planted in a position fully exposed to the sun. In the Hills sow in March or April, the perennial varieties here make large bushes, flowering profusely for years.

LYTHRUM. Nat. Order, *Lythraceæ*

A very old annual, but rarely seen in cultivation here; bears its small rose or pink flowers in immense profusion for a long period; should be sown in the open border at the same time as other annuals. Varieties,—*L. roseum* and *L. flexuosum*.

MALOPE. Nat. Order, *Malvaceæ*.

A very pretty annual with peculiar bell shaped flowers, somewhat resembling those of the *Abutilon*, but rarely, however, cultivated with much success amongst us, as the plants invariably die off on the first approach of the hot season; the seed should be sown as early as possible after the rains, in the place where they are to remain. If liberally treated and grown in a good rich soil, they may sometimes be brought forward enough to flower by February or March.

MALCOLMIA. Nat. Order, *Cruciferæ*.

Malcolmia maritima, or Virginian Stock, is a well-known little annual, very effective when sown in large masses or as an edging, producing its bright red, crimson, or white flowers in great profusion. Seed should be sown immediately after the cessation of the rains in soil well enriched with old cow-manure. The plants rarely attain a height of more than six or eight inches, and commence flowering in about two months from the time of sowing the seed.

MARIGOLD. See *Tagetes*.

MARTYNIA.

Nat. Order, *Pedaliaceæ*.

M. fragrans, which is the only annual variety belonging to this genus, thrives to perfection in this country. Seed should be sown early in October in good rich soil in the open ground. The plants will commence to produce their large, rose-coloured, highly scented flowers in about eight or nine weeks from the time of sowing, and will continue flowering profusely for some



MAUBANDIA

months. Occasionally plants may be induced to remain over a second year, but as a rule they damp off during the rainy season.

MAURANDIA. Nat. Order, *Scrophulariaceæ*.

Maurandia Barclayana and its several varieties are all very beautiful climbers that thrive well in the plains, seed may be sown at any time from June to October and if liberally treated will bloom freely in about 4 months from the time of sowing.

MESEMBRYANTHEMUM. Nat. Order, *Mesembryaceæ*.

A small group of very handsome dwarf annuals of a succulent nature, the flowers of which only open when fully exposed to the sun. Seed should be sown in October in pans of light rich soil and is better covered with a pane of glass only till it germinates. As soon as the plants are strong enough, they should be put out in the open border or in pots, care being taken that no water lodges round the collar, otherwise they invariably damp off. Varieties :—

M. capitatum, yellow.	M. bicolor, pink, rose and white.
M. cordifolium variegatum, yellow.	
M. glabrum, yellow.	M. album, purple and white.
M. nodifolium, white.	

M. crystallinum or Ice Plant is much used in Europe for garnishing, and a well grown specimen is a very pretty object. Seed should be sown at the same time as the preceding, and when strong enough, the plants put out in beds from nine to twelve inches apart.

MIGNONETTE see *Reseda*

MIMULUS (Monkey Flower). Nat. Order, *Scrophulariaceæ*.

One of the most beautiful annuals in cultivation ; should be found in every garden ; produces in endless profusion for months its bold handsome flowers in almost every shade of colour, most of which are fantastically spotted or maculated. Seed should be sown in October in pans. Being very minute, it is advisable to mix it with sand, and then scatter evenly over the surface, covering it but very lightly with fine soil. Water should not be given them from above, but as soon as the soil becomes slightly dry, the pots or pans should be placed in water and allowed to remain till the soil is well saturated by the water passing up from below. As soon as the plants are strong enough to handle they should be pricked out into small pots, frequently removing them into larger sizes as they become stronger. They require a very light sandy soil ; a compost of one-third each of coarse sand, good loam and leaf mould, or very old cow manure, suits them well. It is almost impossible to water the plants too freely, and they are benefitted by keeping the pots constantly standing in saucers or shallow pans of water. There are an immense number of distinct varieties, the best of which are the following,—



MIMULUS, EMPEROR

MIMULUS, QUEEN'S PRIZE.—A splendid new class with very large flowers most fantastically marked.

MIMULUS, CLAPHAM'S SUPERB STRAIN—Remarkable for the great size and superb colouring of the flowers.

MIMULUS, CARDINALIS (GRANDIFLORUS).—A tall variety producing flowers of the most brilliant colours.

MIMULUS, TIGRINUS, NEW GIANT.—Flowers of a gigantic size and of various colours, some richly spotted, others strikingly blotched with rose, carmine, dark or light crimson, &c, on a light yellow ground.

MIMULUS, DUPLEX.—Beautiful double hose-in-hose flowers of various colours.

MIMULUS, EMPEROR—This new variety was raised by crossing the well-known *Old Duplex Mimulus* with flowers of the large flowering strain and after very careful selection and hybridising of the finest and largest flowers for several years, this grand novelty has been obtained. The illustration is taken true from nature, and will show best the difference between the older varieties and the new large-flowering. The calyx is of very great size and of the same rich and wonderful colouring as the flower itself. It will be found a charming plant for borders or small beds, also admirably adapted for pot culture.

MINA LOBATA. Nat. Order, *Convolvulaceæ*.

A very fine new climber of Mexican origin, flowers 15 to 25 in number, borne on graceful spikes, blooms bright-red, changing to orange and cream. Seed should be sown in October in the plains, the plants being of rampant growth will require the support of a strong trellis, they will flower in about four months from the time of sowing. In the Hills sow in April or May, the plants will then come into bloom in August and continue to flower profusely till cut down by frost.

MUSK. *Minulus Moschatus* Nat. Order, *Scrophulariaceæ*.

Seed of this old favorite may be sown in the plains in October and the plants will grow freely till the commencement of the hot season but can rarely be induced to flower; in the Hills, however, it grows and flowers freely and may be kept over from year to year without difficulty, this requires the same treatment as the other varieties of *Mimulus*.



MYOSOTIS PALUSTRIS.

sown early in October in the plains, and as soon as they are large enough should be transplanted into pots or pans; the plants being of a semi-aquatic nature should be grown in a moist shady situation, and it is advisable to keep them continually standing in trays or saucers of water, this will insure their having an equable degree of moisture at the roots.

MYOSOTIS ALPESTRIS.—The alpine Forget-me-not; beautiful pale blue.

MYOSOTIS ALPESTRIS ALBA.—Same as the preceding but with beautiful pure white flowers.

MYOSOTIS ALPESTRIS ROBUSTA GRANDIFLORA.—The flowers of this new and

MYOSOTIS (*Forget-me-not*).

Nat. Order, *Boraginaceæ*.

The many varieties of Forget-me-not although perennials, must all be treated as annuals in this country. Seed may be



MYOSOTIS ALPESTRIS VICTORIA.

distinct variety are considerably larger than those of any other Forget-me-not, and of a beautiful sky-blue color, with a clearly defined yellow eye. The plant resembles in habit the form of a candelabrum, a peculiarity which distinguishes it from any other sort. As it comes perfectly true from seed, this fine *Myosotis* cannot fail to become a general favourite.

MYOSOTIS ALPESTRIS ROBUSTA GRANDIFLORA ALBA.—A splendid new white variety of the preceding.

MYOSOTIS PALUSTRIS.—The true Forget-me-not; beautiful transparent azure blue flowers.

MYOSOTIS ALPESTRIS VICTORIA.—This new Forget-me-not, is of extremely robust habit, growing only about 5 to 7 inches in height, with a diameter of 8 to 10 inches, and when fully grown is quite globular in shape and perfectly covered with flowers. A very useful plant for beds, edgings, &c., and much recommended.

NASTURTIUM (Indian Cress.) Nat. Order, *Tropaeolaceæ*.

Probably one of the oldest annuals in cultivation. It is stated that *Tropaeolum majus*, or the climbing Nasturtium, was introduced into England from Peru in 1686, and the dwarf variety even earlier than this; but like many other plants it has been much altered and improved by cultivation. All the varieties thrive

well in this country with but little care bestowed on them. Seed should be sown in the place where the plants are to remain immediately after the cessation of the rains. To induce them to germinate freely it is advisable to soak them for three or four hours in hot water before sowing. The dwarf varieties make most effective bedding plants, and are extensively used for this purpose in England in combination with Lobelias, Geraniums, &c. In this country they are



TOM THUMB NASTURTIUM.

particularly useful as border plants, and are also very effective ornaments when grown in pots. Care must be taken not to give them too rich a soil, otherwise the flowers will not be thrown well above the foliage. A compost of one-half each of good garden soil and broken brick rubbish suits them well. The taller varieties, on the other hand, require a more liberal treatment, and should be grown in a good soil well enriched with manure, and will require a trellis for their support. All the varieties produce

seed freely; this should be carefully gathered, and after being well dried stored in bottles or tins for sowing the following season. The produce of this will be found quite equal to imported seed, this being one of the few plants that do not perceptibly deteriorate in this country. There are an immense number of varieties in cultivation, of which the following are the most distinct:—

<i>Climbers.</i>	<i>Dwarfs.</i>
T. <i>majus atropurpurea</i> , maroon.	T. <i>Beauty</i> , scarlet spotted.
T. " <i>coccineum</i> , scarlet.	T. <i>Lilli Schmidt</i> , scarlet.
T. " <i>nigro purpurea</i> , dark purple.	T. <i>Pearl</i> , white.
T. " <i>Regelianum</i> , crimson.	T. <i>Crystal Palace Gem</i> , yellow spotted.
T. " <i>King Theodore</i> , nearly black.	T. <i>cœruleum roseum</i> , rose.
T. " <i>luteum</i> , yellow.	T. <i>King of Tom Thumbs</i> , scarlet.
T. " <i>Schillingi</i> , yellow spotted.	T. <i>King Theodore</i> , black.
T. " <i>Dunnett's Orange</i> , deep orange.	T. <i>Ruby King</i> , carmine.
	T. <i>Empress of India</i> , crimson.

The four last mentioned of the dwarf kinds belong to a new race very distinct from the original type, having dark blue-green foliage, which forms a striking contrast to their brilliant flowers.

NEMESIA. Nat Order, *Scrophulariaceæ*

A small group of dwarf annuals of a trailing habit, well adapted for rockeries or edgings, producing their unpretending little flowers in great profusion. Seed should be sown with the other annuals in October in any good garden soil. Varieties:—

N. <i>compacta</i> .	N. <i>floribunda</i> .
N. " <i>alba</i> .	N. <i>versicolor</i> .

NEMOPHILA. Nat. Order, *Hydrophyllaceæ*.

In Europe this is one of the most extensively cultivated of all annuals. In this country, however, it is but rarely seen grown to perfection. A general complaint among gardeners is that the seed almost invariably fails to germinate—a fact more generally owing to mismanagement than any other cause. It is a very common practice to sow the seed at the same time as most other annuals in September or October, and herein lies the whole secret of so many failures. Instead of this, if it is kept over and sown towards the end of November, it generally grows freely enough. They require a light rich soil, and should be grown in a shady situation, and must be kept liberally supplied with water through the whole period of their growth.

There are now an immense number of varieties in cultivation, the best of which are *N. insignis* and *N. maculata* and their many varieties, embracing almost every shade of colour.

NICOTIANA. Nat. Order, *Solanaceæ*

The ornamental varieties of the Tobacco are but rarely seen in cultivation here, though extensively employed in England for what is termed sub-tropical gardening. Some of these are not only handsome foliage plants but also produce their showy delicately coloured flowers in great profusion. *N. tabacum variegata* is a new variety with beautifully marked foliage, well deserving a place in every garden. Seed should be sown in September or October, and as soon as strong enough, they should be put out in the border. They grow freely in any good light soil. The new scented variety *N. affinis* is fast becoming popular and is certainly deserving of a place in every garden.

NIEREMBERGIA. Nat. Order, *Solanaceæ*

A small family of pretty trailing plants which, although perennials, can only be successfully grown when treated as annuals. Seed should not be sown before the commencement of November; they require a good soil and an abundance of water. Varieties :—

<i>N. frutescens</i> , pink.	—	<i>N. grandiflora</i> , white.
<i>N. gracilis alba</i> , white.	—	<i>N. nigricans</i> , crimson,

NIGELLA. Nat. Order, *Ranunculaceæ*.

This is also known as "Love in a Mist," an unpretending group of annuals of but little beauty. Seed may be sown at the same time as the other annuals in October in the place where the plants are to remain. It thrives best in any moist shady situation.

NOLANA. Nat. Order, *Nolanaceæ*.

A very beautiful annual of a trailing habit; should be found in every collection, requiring but little care in its cultivation and produces in the greatest profusion its large Convolvulus-like flowers of almost every shade of colour. Sow the seed in October in the place where the plants are to remain, as it does not bear transplanting well. They require a light porous soil, and a liberal supply of water. Varieties :—

<i>N. atroplicifolia</i> , blue, white, yellow,	<i>N. paradoxa</i> violacea, dark blue.
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<i>N. grandiflora</i> alba, white.	<i>N. prostrata</i> , blue and white.
<i>N. lanceolata</i> coerulea, blue.	

ŒNOTHERA. Nat. Order, *Onagraceæ*.

A very large family, both of annuals and perennials, some of them being extremely beautiful. They must all be cultivated as annuals in the plains, and should therefore be sown as early as possible in the season, to bring them forward enough to flower early in the spring before the weather becomes too warm.

It is very advisable to sow the seed where the plants are intended to be grown, as they do not bear transplanting well. They require a light rich soil, and should be grown in rather a shady position, they can however rarely be brought to thrive satisfactorily in Bengal. Plants may be raised from seed sown at the same time as the other annuals, but they rarely if ever can be induced to put forth a single flower.

PAPAVER. Nat. Order, *Papaveraceæ*.

During the past few years single Poppies have become very fashionable, some of them are certainly exceedingly showy, but not nearly so beautiful as the double varieties.



PAPAVER LÆVIGATUM.

PAPAVER PAVONIUM, "THE PEACOCK POPPY."—The flower has a conspicuous black zone near the centre which brings out the vivid scarlet and cherry crimson, the flowers are nearly 4 inches across.

PAPAVER UMBROSUM, Rich vermillion with a black spot on each petal;

PAPAVER LÆVIGATUM. —New and very showy annual Poppy from Persia, about 2 feet to $2\frac{1}{2}$ feet high, with fine shaped flowers 4 inches in diameter, of a brilliant deep scarlet colour,

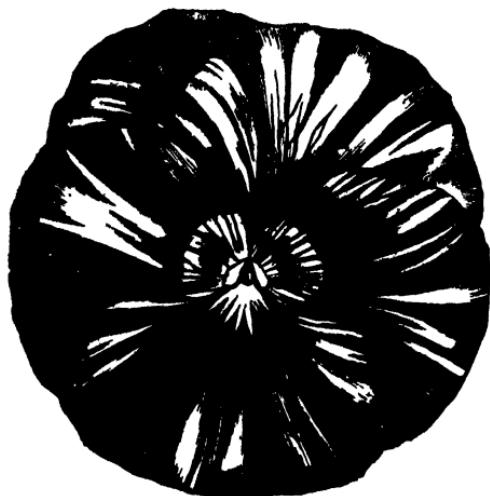
with black spots, surrounded by a white margin at the base of each petal. The two outside petals of the flowers are twice the size of the inside ones, so that each couple form a round cup by themselves, very free flowering and extremely showy.

For other varieties see Poppy.

PANSY OR HEARTSEASE. Nat. Order, *Violaceæ*.

Who is there, possessing any love for a garden, that does not admire the Pansy or Heartsease; and yet how rarely we see it properly grown in this country. What we are accustomed to see in our gardens are miserable woody plants producing poor,

and insignificant flowers, generally dull in colour, hardly larger than a well grown Violet should be. You will invariably hear the growers of these attribute all the blame to the seed being of an inferior strain, whereas in ninety-nine cases out of a hundred the fault is due entirely to unskilful treatment of the plants. It is no uncommon thing to see them planted out in the open border, or growing in pots fully exposed to the sun throughout the day. This treatment may be all very well for the Phlox or Pro-



PANSY, IMPROVED STRIPED.

tulaca, but for any member of the Violet family it is almost certain death.

In Europe, where the plant is treated as a perennial, there are an immense number of named varieties. These are perpetuated by being propagated from the off sets or shoots which they produce freely. In this country, or rather in Bengal, where we can only grow them as annuals, they must, of course, be raised from seed, and one of the chief points to be considered is the selection of seed. It will in the end be cheaper to pay a fair price for a packet of seed of any very good strain, although it may not contain more than a hundred seeds, than it would be to give perhaps only a fourth of the cost for a packet possibly containing a thousand seeds of an inferior description. In all probability you would not get so many plants from the former, but the quality will be there, and very frequently seed of any very good strain will produce plants with flowers in every respect equal to a great many of the named varieties from which most of them are descended; and, even though they may to a certain extent lack the perfection of form and symmetrical markings that distinguish the best standard kinds, this will be amply compensated for by the great variety of style and diversity of color generally so prominent in a batch of good seedlings.

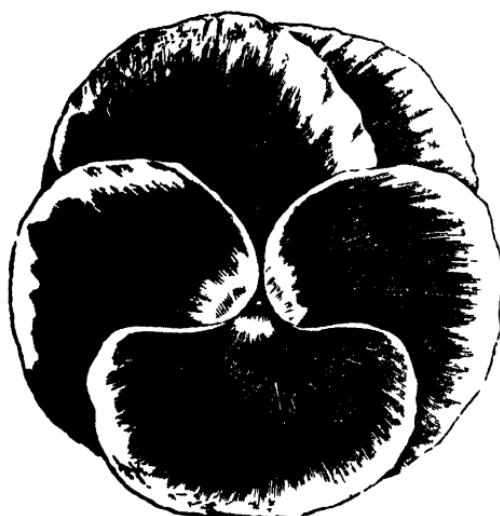
Seed should be sown in well drained pots or pans filled with a rich, light soil covering the seed but very lightly. They must then be placed in a close, shady situation, under a glass frame if available, or a very good substitute is to cover the pot or pan with another one of the same size. This will tend to promote its

germinating more freely. When once the plants are well above ground, the only real difficulty in the cultivation of the Pansy has been surmounted.

As soon as the plants are strong enough to handle, they should be transplanted into three inch-pots, one plant in each. The principal point in the cultivation of this plant is to select a light, airy, and yet at the same time partially shaded situation. Some may say that this is a rather difficult thing to obtain, and if we were to depend on finding a natural site with all these points combined, we should certainly, in the majority of gardens, have to look in vain. The difficulty, however, is easily overcome at a very small expense. I have tried the following plan for years, and invariably found it successful :—

Select an airy and exposed situation in any part of the garden,

facing due south if possible ; mark off a plot of the size required ; one twelve feet by six will generally be found large enough for most gardens. Then have a row of strong stakes driven down firmly at a distance of two feet apart on the north side ; the height of these should be three feet, and a similar row in front on the south side, but only eighteen inches high. The two rows must then be fastened together by cross bars, on which will rest a wood-frame



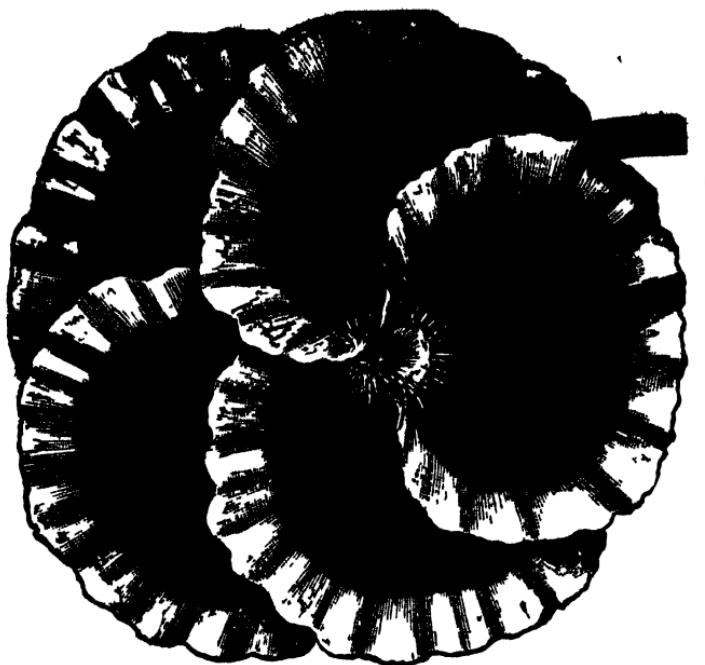
PANSY, ODIER'S BLOTTCHED.

made of the size of the ground selected. This should be covered with common country canvas, or ordinary calico, though the former is to be preferred, as it admits more air. The frame must not be fastened down to the supports, as it should be removed each evening after sunset, and replaced in the morning before the sun becomes too powerful. Under a structure of the size and description given, upwards of two or three hundred pots may be accommodated, and it is not only useful for the Pansy, but is equally valuable for the Aster, Geranium, Violet, Fuchsia, and many other plants. To prevent slugs, worms or other vermin getting at the

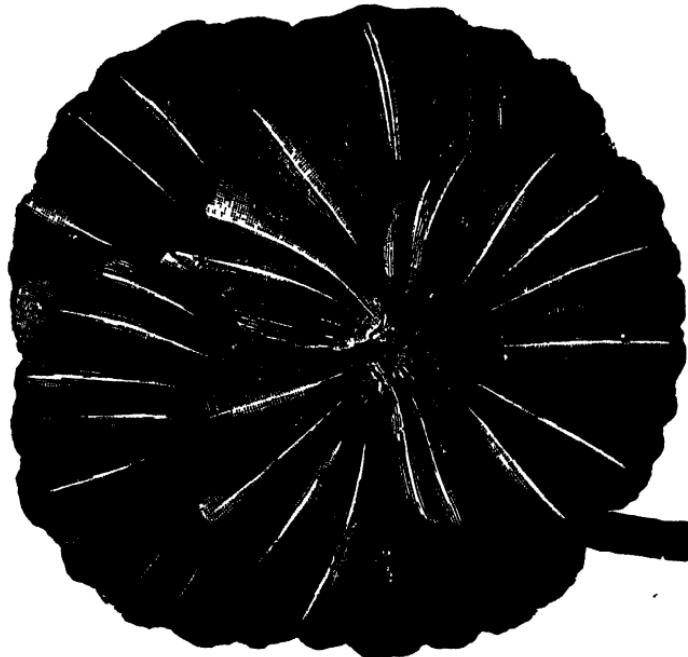
ROEMER'S GIANT PRIZE PANSIES.

FOR INDIAN AMATEURS.

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ROEMER'S GIANT FIVE-SPECIED PANSY.



ROEMER'S GIANT STRIPED PANSY.

plants, it is advisable to cover the ground under the shade with a layer of about three inches of coal cinders before placing the pots under it.

To proceed, however, with the cultivation of the plants. As soon as they have become well established and are growing freely, they should be watered every third or fourth day with weak liquid manure. What suits them best is guano, mixed at the rate of half an ounce to the gallon of water ; or, failing this, fresh cowdung answers very well. As soon as the pots they are in become well filled with roots, they should be shifted into larger ones for flowering in. As a rule five or six-inch pots will be found sufficiently large for this purpose. The compost used must be light, rich and open : one composed of one-fourth each of good rich loam, leaf mould, very old cowdung and coarse sand, invariably suits them well. After being repotted, they should again be treated as before with regular dressings of liquid manure, till they commence flowering, when it should be withheld, and then supplied freely with water only.

If any specially good varieties appear amongst a batch of seedlings, it is advisable to keep them apart from the other plants, with the object of saving seed from them. If good plants are selected, and kept quite away from any others of inferior merit, the produce of the seed thus saved will hardly be inferior to that imported, and it has the further recommendation that it invariably germinates more freely.

In the Hills, seeds should be sown in August or September, and as soon as they are large enough, the seedlings should be transplanted into boxes or pans in which they may be wintered. Early in February these should be potted off singly into 6-inch pots, in which they will flower freely by April or May. Seed may also be sown in February or March under glass and if grown on rapidly will flower but little later than those sown in the autumn. The plant in the Hills may be treated as a perennial and when any really good varieties are obtained these may be easily propagated by cuttings taken off in the autumn, these, if kept close, will root quickly, and will make plants quite as soon though perhaps not so vigorous as those raised from seed.

During the past few years a new giant race of Pansies has been introduced, and although most of these may not be perfect in form when judged from an exhibition point of view, still their immense size combined with the remarkable variation in colours and markings now found in them, are sure to make them much sought after by all lovers of this dear old plant.

There are now several distinct giant strains of Pansies offered by seedsmen the best known of these are the "Giant Trimardeau,"

"Bugnot's Giant," Cassier's Giant," and "Roemer's Giant," all of these strains are good and when obtained genuine may be relied on to produce flowers of mammoth proportions, that is of course provided they receive liberal treatment, for it is hardly necessary for me to remark that "Giants" of any kind, no matter whether flower or vegetable, necessarily require extra feeding to produce the best results.

PENTSTEMON. Nat Order, *Scrophulariaceæ*.



PENTSTEMON.

A beautiful genus of perennials well adapted for culture in the hills where they grow luxuriantly and flower profusely, in the plains, however, I have never been able to induce them to bloom satisfactorily, nor have I ever heard of any one being really successful with them, certainly plants may be induced to put forth a few straggling spikes with very small blooms during the hot and rainy seasons. In the hills they require the same treatment as recommended for *Campanula*.

PETUNIA. Nat. Order, *Solanaceæ*.

This beautiful plant can only be grown successfully as an annual in the plains.

Seed should be sown in pans of light, rich soil which must be kept, in a shady

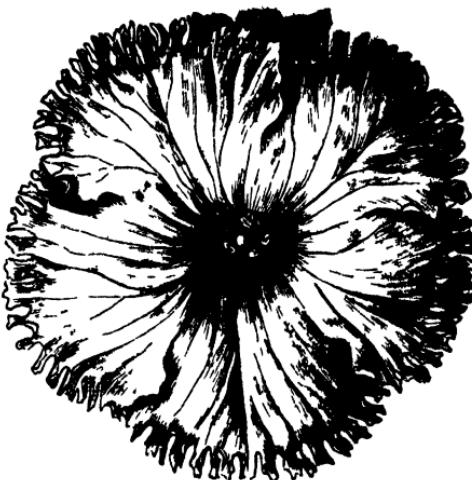
situation till they have germinated, when they should be allowed as

much light and air as possible, only removing them under shelter during the continuance of heavy rains. To get such fine seed to do well, it is important that the soil should be made perfectly smooth and level, and when this is done, watered through a fine-rosed pot, so as to avoid having to wet the earth afterwards, till the young plants make their appearance. By adopting this course and covering the pot or pan with a piece of glass, so as to maintain an equable temperature and prevent evaporation, success will be certain. Even the most minute seeds may be induced to germinate in this way, but in all cases where it is so small that it has to be sown on the surface, it should have a sheet of paper laid over it to shut out the light for the first few days, after which it will require close watching and must be uncovered immediately germination takes place. As soon as the seedlings are large enough to handle they should be pricked out into pans or boxes at a distance of two inches apart. When about two inches high, they may be planted out in beds or if intended for pot culture should be put singly into four inch pots frequently changing them into larger sizes as they increase in growth.



PETUNIA GRANDIFLORA DOUBLE FRINGED.

varieties are remarkable for the large size of the flowers and for their rich and varied colours, and these also are of good substance.



PETUNIA HYBRIDA GRANDIFLORA FIMBRIATA.

The soil that suits them best is a rich sandy loam, very old cow manure, and good leaf mould in equal parts, when the plants are in vigorous growth they should also be occasionally supplied with weak liquid manure. The double flowered

The flimsy nature of the flowers of the single Petunia is rather against them, but this charge cannot be urged against the double forms.

The double varieties are best adapted for pot culture, and to produce good specimens must be treated liberally. As soon as plants commence to branch freely the shoots should be stopped by nipping out their points, which may be repeated again and again. This will stiffen them in such a way that they may be grown entirely without sticks or other support. When beginning to bloom, liquid manure will be found a great help, as it is always better to administer stimulants than to use any excessive quantity in a solid form in the soil, the tendency of which is to produce gross growth that seldom or never flowers well.

The single varieties are well adapted for bedding purposes, and are very attractive when grown in large masses. They require a position that is well sheltered from high winds as this frequently causes serious injury, at the same time they must be fully exposed to sun and air. It is a good plan to place some short twiggy branches amongst them when they are planted in a bed, the shoots run naturally amongst these and receive sufficient support to prevent their being knocked about by heavy rains. In the Hills the Petunia may be raised from seed in February, March or April, for the earlier sowings, however, it will be necessary to give them slight bottom heat and to keep them under glass till they are strong enough to put out. Where any good varieties have been secured a stock of these may be easily propagated by cuttings, they strike readily in sand under glass.

PENTAPETES. Nat. Order, *Bythneriaceæ*.

A plant but rarely seen in our gardens. This is no doubt owing to the fact that it is a common weed in most parts of Bengal, being found growing extensively in most paddy fields, producing in great profusion its large trusses of bright carmine flowers, and is certainly a plant well deserving a place in every garden. Seed should be sown in July or August, and the plants will be in full flower by October; the plant being of a semi-aquatic nature thrives best if the pots in which they are grown are kept constantly standing in water. There is also a white flowered variety, but it is not nearly such an ornamental object as the above.

PERILLA. Nat. Order, *Verbenaceæ*.

This is extensively employed in England for carpet bedding, its beautiful metallic bronzy purple foliage contrasting well with Geraniums, Calceolarias, &c. Seed should be sown in October in the place where the plants are to remain. Varieties:—

P. *nankinensis*.

P. *atropurpureus laciniata*.

P. *ocymoides*.

P. *nankinensis variegata*.

PHACELLA. Nat. Ord., *Hydrophyllaceæ*.

A small group of annuals with very insignificant flowers, and prized only for their beautiful fern-like foliage. Seed should be sown early in October, in pans, and the plants shifted singly into pots as soon as they are strong enough ; they require a light sandy soil, and thrive best in a shady situation.

PHARBITIS. Nat. Ord., *Convolvulaceæ*.

A small group of climbing plants but rarely seen in cultivation here. *P. limbata* is a very showy variety, and thrives well in this country if treated in the same way as the *Convolvulus*.

PHLOX DRUMMONDI. Nat. Ord., *Polemoniaceæ*.

PHLOX DRUMMONDI, GRANDIFLORA

The annual varieties of the Phlox are now so well known, and are such popular favorites with every possessor of a garden, that it is hardly necessary to say a word in their favor. There is certainly scarcely any other family of annuals that can compare with this in variety of colour and profuseness of bloom, or that retains its beauty for such a lengthened period ; they require a good rich soil, liberally manured, and must be grown in a situation fully exposed to the sun. To render them effective they should be grown in large masses.

Sow the seed in October in pans, which must be kept well shaded till the plants are up. As soon as they are two inches high they should be transplanted into the open ground at a distance

of six inches apart, or, if grown in pots, three plants in a six-inch pot will be found sufficient to make good specimens. There are a large number of varieties ; these however are now generally divided into the following distinct groups :—

P. Drummondii is the original type of the whole family, and the one most commonly found in our gardens.

P. Drummondii grandiflora is a great improvement on the above, producing immense trusses of large flowers.

P. Drummondii nana compacta is another new strain, the plants of which are of a very bushy habit, and rarely exceed six inches in height.

P. Drummondii verbenaeflora. As the name implies, in this group the flowers and form of trusses much resemble those of the Verbena.

In each of these groups there are some twenty to thirty varieties, embracing almost every shade of colour from pure white to the deepest purple.

In addition to the above, several distinct new classes have been introduced during the past few years which when better known are sure to become exceedingly popular, the new *cuspidata* class especially is deserving of attention, the fantastically shaped flowers being entirely different in form from those of any plant in cultivation.

PHLOX DRUMMONDI FIMBRIATA.—The flowers are between the size of the well-known *Phlox Drummondii* and the *Phlox Drummondii Grandiflora*. The petals of all the known varieties of *Phlox* are entire, but in this variety they are partly three-toothed, the centre teeth are almost twice as long as the lateral ones, all distinctly bordered with white, which together with the bright eye of the centre, picturesquely contrast with the magnificent velvety colours ; violet, blue, purple, &c., &c.

PHLOX DRUMMONDI CUSPIDATA.—This novelty has been selected from the *Phlox Drummondii Fimbriata*, and is quite unique in character. The growth is generally more compact than that variety. The centre-teeth of the petals (five in number) are four to five times as long as the lateral ones and project beyond them like little spines $\frac{1}{2}$ to $\frac{3}{4}$ inch. Thus the flowers appear to have a long pointed, distinctly marked, regular *Star-like form*, whose beauty is improved by the broad white margins which border the edges of the petals.

PHLOX DRUMMONDI, DOUBLE.

PHLOX DRUMMONDI DOUBLE.—A very fine new class producing about 80 per cent. of fully double flowers which are of the same size as the single varieties ; they have the advantage of remaining in bloom for a much longer period.



PICOTEE see *Carnation*.

PINKS see *Dianthus*.

POPPY. Nat. Order, *Papaveraceæ*.

A large family embracing both perennial and annual varieties.



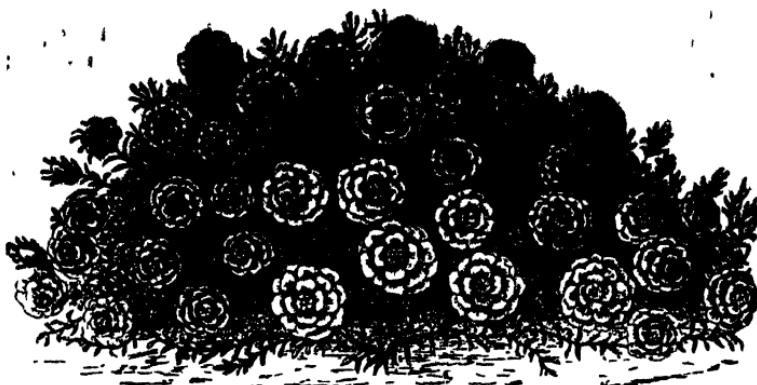
POPPY, CARNATION FLOWERED.

they should be thinned out to a distance of six inches apart, otherwise, if they become too crowded, the flowers they produce will be very inferior. During the past few years a large number of new varieties both single and double flowered have been introduced, amongst these "The Shirley," "The Bride," "Eider Down," and the "New Iceland" are exceedingly beautiful, though for general garden decoration, it is very doubtful if any will prove more useful than the Carnation and Peony flowered, both of these classes embrace a wonderful range of colours and are besides most easily grown.

PORFULACA. Nat. Order, *Portulaceæ*.

Too well-known to need description. They thrive to perfection in this country, and retain their beauty for a very long period. Seed may be sown at any time from July to December; it is advisable to mix it with sand before sowing, as the seed is very minute; it may either be covered very lightly with soil, if in the open ground, or, if in pots or pans, a pane of glass laid over it will be sufficient. A mistake frequently made in the cultivation of this plant is to allow them to become too crowded, as they thereby invariably produce very inferior flowers. If put out at a distance of six inches apart they will quickly spread themselves and make strong bushy plants.

In this country, however, the cultivation of all of them must be the same, that is as annuals only, and certainly as such they are indispensable, for there is hardly any other class of plants that requires so little attention and makes such a gorgeous display in our gardens. Seed should be sown in the place where the plants are to remain, as early as possible after the expiration of the rainy season. They require a light sandy soil, and an abundance of moisture. If the plants come up too thickly,



Of all annuals that can be grown with success in this country I know of none more beautiful than Portulacas. Their rich colours, and the freedom with which they flower when under favourable conditions, render them well worthy of special attention. Any one who has a narrow dry border or small flower bed similarly circumstanced may grow these beautiful plants to perfection with a minimum amount of trouble. The simplest way of raising a stock of plants is to sow seeds in small pots. Prepare a number of three inch pots, sow a few seeds in each, and keep them well sheltered from heavy rains till firmly established. Careful watering is also very necessary, as damp is a much greater enemy to them than heat. The next thing is to select a position for them, and this being done, a suitable compost must be prepared, as they are not deep rooting plants, the depth of this need not be more than six inches. The compost should consist of equal quantities of light garden soil, old mortar, leaf mould and a good sprinkling of sand. The plants should be turned out of their pots without being disturbed and placed about five inches apart; this will ensure the ground being covered; a little water should be given at the time of planting to settle the soil about their roots; and occasionally during their growth, but they require much less moisture than most other annuals.

PRIMULA, Nat. Order, *Primulaceæ*.

It can hardly be said that the many beautiful members of this family can be cultivated with unqualified success in the plains, seed sown in September and pushed forward will occasionally produce small blooming plants by March, but the flowers are invariably few in number and poor in quality. In the hills, however, it flourishes, and fine specimens are easily grown with but little trouble. The best time to sow is August or September, when if the plants can have the protection of a frame during winter they will bloom freely by February or March.

The mode of treatment I have found most suitable is to prepare a quantity of moderately fine loam and leaf-soil in equal parts, with just sufficient sand added to keep the compost porous; two or three 6-in. pots should then be prepared for the seed. Half fill the pots with crocks, and on these place a little rough soil or fibre; fill the pots in the usual way with the prepared soil, and sow the seeds, lightly covering them, but not adding sand to the surface after sowing. This is often done, but it cannot be too strongly condemned, for where fine sand is used to cover seeds alone, there is pretty certain to be a close uncongenial surface for the seeds, and which in some degree prevents germination taking place satisfactorily.

As soon as the seedlings are large enough to handle, they



PRIMULA SINENSIS FIMBRIATA.

should be pricked off into 6-in. pots or pans with good drainage; the latter, indeed, is a very important point to bear in mind in all stages of their growth. The Primula dislikes a close, soddened compost, and will never thrive in such; therefore good drainage and rather rough soil (in reason) should be strictly adhered to. When Primulas damp off, it may generally be attributed to the stagnant nature of the soil.

The soil which appears to suit them best is a mixture of well-decomposed leaf-mould and fibrous loam, in about equal proportions, to which may be added some thoroughly rotted manure and about one-third of silver sand to the whole. The soil should be moderately fine and moist but not wet when used, and the plants only potted with that degree of firmness which tapping upon the bench and ordinary pressure of the fingers will ensure. The crown of the plant should be kept well up and the surface of the soil made smooth and firm. During the winter and early spring months, the plants should be kept in a temperature ranging about 50 deg. at night and 55 deg. to 60 deg. during the day, which will keep them gently moving, too much heat, especially at night, causing a weakly growth. Air should be given on all favourable occasions, and in spring and summer they will require shading on hot days.

In damp weather, too, the waterpot must be carefully used, allowing the plant to dry thoroughly before watering ; a wet stagnant surface will cause decay to set in at the collar, and the healthiest plant will suddenly turn sickly and die from this cause, decay being germinated between the point where root and foliage unite.

With respect to re-potting give them no greater amount of fresh soil than is absolutely necessary ; let the shift be as small as possible, ascertaining that it is really required ; the soil being used somewhat fine will admit of this recommendation being carried out. When once the desired size is attained, health and vigour may be preserved by an annual top-dressing and an occasional watering with guano water.

PYRETHRUM (Golden Feather.) Nat. Order, *Asteraceæ*.

A few years since when carpet bedding was the popular craze amongst all sorts and conditions of gardeners "Golden Feather" was probably more extensively grown than almost any other plant with the exception of the scarlet Geranium, now however that this craze is a thing of the past, this fine plant is being much neglected and we rarely see it grown as it ought to be grown. In the plains seed should be sown early in October, the seed germinates very irregularly, some

plants appearing within ten days and others frequently after two months, remove them from the seed pan as soon as large enough to handle, they must be grown in a position fully exposed to the sun, otherwise the foliage never takes on the bright colour for which it is so much admired.

QUAMOCLIT. Nat. Order, *Convolvulaceæ*.

An indigenous plant frequently met with in our gardens, and when well-grown is certainly a very ornamental object, its bright scarlet flowers forming a splendid contrast with its deep green



foliage. Seed may be sown through the whole of the cold season, and if left undisturbed, generally reproduce themselves freely from self-sown seed.

RESEDA ODORATA (Mignonette.) Nat. Order, *Resedaceæ*.

This well-known old favourite thrives to perfection in our gardens, and where once grown it invariably reproduces itself from self-sown seed the following year. There are few other annuals that are so universally popular and so generally cultivated as this, and certainly no other that has been more improved by artificial or natural hybridisation or judicious selection. It is difficult to recognise the original type of *R. odorata* in in the many splendid new varieties we now possess. Take, for instance, Miles' Hybrid Spiral, which throws up spikes of flowers, ten to twelve inches in length; or the new Golden Queen, which produces flowers of a bright golden yellow.

MIGNONETTE, MILES' SPIRAL.

Seed may be sown from October to December in any good, rich soil. It should be sown in the place where the plants are to remain, as it does not bear transplanting well. The following are the best varieties:—

Ameliorata.
Crimson Giant.
Golden Queen.
Hybrid Tree.
Diamond.
Hybrid Spiral.

Pumila erecta.
Pyramidal Bouquet.
Garraway's white.
Parsons' Tree.
Red Giant.
Variegated leaved.

RHODANTHE. Nat. Order, *Compositæ*.

A small group of very beautiful everlasting flowers, but rarely, however, cultivated with much success in the plains. They require



a light, rich, well-manured soil, and should be grown in a situation fully exposed to the sun. Seed must be sown in October in pans and the plants pricked out as soon as they are large enough to handle. They are much benefitted by frequent transplanting. Varieties :—

R. atrosanguinea.
R. maculata.
R. , , alba.

R. Manglesi.
R. , , flore pleno.
R. , , Prince Bismarck.

RICINUS. Nat. Order, *Euphorbiaceæ.*

These have become extremely popular in Europe during the past few years for use in sub-tropical gardening. In this country, however, they are but rarely allowed a place in our gardens. This is probably owing to the fact that *R. communis*, or *Palma Christi*, the well-known Castor Oil Plant, is one of the most common jungle plants in Lower Bengal. There are now probably upwards of a hundred hybrid varieties in cultivation, and amongst these there are many with very beautiful foliage and others again are remarkable for the brilliancy of their flowers or the bright colour



RICINUS.

of their fruits, and are certainly deserving a place in every garden where sufficient room can be found for them. Although in Europe these are all classed as annuals, in this country most of the varieties may be grown as perennials, and frequently attain a height of twelve to fifteen feet within twelve months from the time of sowing. Seed may be sown any time after the expiration of the rains in the border where they are to remain. They thrive in any good, deep soil if kept liberally supplied with water during the early part of their growth. The following are the leading varieties :—

RICINUS GIBSONI, dark purplish foliage and stems.
RICINUS COCCINEUS, the stalks and leaves are of a bright metallic bronze colour, often almost as red as fire, bunches of fruit brilliant crimson.

RICINUS, DUCHESS OF EDINBURGH, somewhat resembling the variety first described but of a darker colour.

CAMBODIENSIS,—Large Palm-like leaves of a bronzy red maroon color, with large red veins ; the main stem or trunk ebony black.

SALPIGLOSSIS. Nat. Order, *Solanaceæ*.

A very beautiful group of annuals which has been wonderfully improved and increased during the past few years, and now includes an immense number of varieties of various forms and in almost every shade of colour, ranging in height from about six inches to upwards of two feet. The new dwarf kinds are extremely beautiful, producing flowers almost equal in size to the larger varieties, and bloom so profusely as entirely to hide the foliage.



SALPIGLOSSIS GRANDIFLORA.

well-manured soil, and should be planted in a situation fully exposed to the sun. It would be impossible to give a complete list of all the varieties now grown. These are generally divided into the following distinct groups, each of which include varieties in almost every shade of colour

S. *Variabilis*.S. " *nana*.S. *Variabilis maxima*.S. " *pumila multiflora*.SAPONARIA. Nat. Order, *Caryophyllaceæ*.

A small group of dwarf plants composed both of annuals and perennials. The former are represented in our gardens by *S. calabrica*, and its numerous varieties. They are especially valuable for edgings or carpet bedding, rarely exceeding four to six inches in height, and producing their small bright-coloured flowers in the greatest profusion. Seed should be sown in October in pans, and the plants put out as soon as they are strong enough.

SALVIA. Nat. Order, *Labiaceæ*.

Most of the members of this genus are perennials, the only annuals being *S. coccinea* and its numerous varieties. These, however, are but rarely seen in cultivation here, the flowers of most of them are very small, and when plants are grown singly have a weedy, shabby, appearance. They are, however, extremely attractive when grown in large masses, as the flowers, though small, are generally very brilliant in colour. Seed should be sown in the place where the plants are to remain, at the expiration of the rains; they require a good, rich soil, and a partially shaded situation suits them best.



SALVIA, COCCINEA SPLENDENS.

SCABIOSA. Nat. Order, *Dipsaceæ*.

A small genus of very handsome plants known in old fashioned English gardens under the name of "Mourning Bride" or "Sweet Scabious," in the plains these must all be treated as annuals and to insure their blooming, seed must be sown as early as possible, they require the same treatment as Asters. In the Hills sow seed in August or September, and if kept carefully through the winter, these plants will bloom freely in April or May.

SCHIZANTHUS Nat. Order, *Scrophulariaceæ*.

A very handsome annual, and well deserving a place in every garden. Being of rather a straggling habit, they are not adapted for growing as single specimens, but when planted in large masses or beds, they are extremely attractive, producing their peculiar-shaped, orchid-like flowers in great profusion, and of the most brilliant shades of colour.

Seed should be sown in October in the place where the plants are to remain, as they do not bear transplanting well. They require a light, sandy soil, and an abundance of water, and should be grown in a situation fully exposed to the sun.

SCHIZOPETALON. Nat. Order, *Cruciferae*.

S. Walkeri, the only known variety of this genus is a very handsome little annual, bearing peculiarly fringed, pure white flowers, which are very sweet scented. It should be sown in the place where the plants are intended to remain, and thrives best in a light, sandy soil, well enriched with manure.

SENECIO. Nat. Order, *Compositæ*.

An extensive genus of plants, principally annuals, many of them of great beauty ; they can, however, but rarely be cultivated with much success in the plains, as they almost invariably die

off on the first approach of the hot season, before the plants can be brought forward sufficiently enough to flower

Seed should be sown early in October in pans, and the plants put out in the beds as soon as they are about two inches high. They require a good rich soil, and must be kept liberally supplied with water. All the annual species are hybrids of *S. elegans*, and include varieties both with single and double flowers. *S. speciosus* is a new perennial variety, introduced into



SILENE PENDULA, DOUBLE.

Europe in 1890, and is described as one of the most brilliantly coloured flowering plants in cultivation, bearing, for a period of six months continuously, its beautiful bright magenta flowers in the greatest profusion.

SILENE. Nat. Order, *Caryophyllaceæ*.

A well-known family of dwarf annuals, well adapted for edgings, rockeries, etc., and also extensively employed in Europe for carpet bedding. The individual flowers are very small, but when

grown in large clumps, their brilliant colours are very attractive. Seed should be sown in October, after the expiration of the rains, in the place where the plants are to remain.

During the past few years an immense number of varieties have been introduced. The best of these are *S. armeria*, *S. orientalis*, *S. pendula*, and *S. pendula compacta*, and their numerous varieties, the last mentioned being the smallest species known, rarely exceeding three inches in height.

SNAPDRAGON. See *Antirrhinum*.

SOLANUM. Nat. Order, *Solanaceæ*.

The annual varieties of the *Solanum*, are now very popular in Europe as decorative plants, many of them being extremely beautiful with their brilliantly coloured fruits of various shades of colour. These are but rarely seen in cultivation here; there is no doubt, however, that they could be grown successfully, as nearly all the other members of this extensive order, either edible or ornamental, thrive to perfection in this country. In the Hills where all the many hybrid forms of *Solanum* grow most luxuriantly, seed should be sown in April or May; as soon as the seedlings are about two inches high, pot singly into six inch pots, these if well cared for, will make splendid plants for decoration during the winter season.



SOLANUM.

SPECULARIA. Nat. Order, *Campanulaceæ*.

S. speculum or *Campanula speculum*, or what is more generally known as Venus's Looking Glass, is one of the oldest annuals in cultivation (first introduced in 1596), but like most other old favorites it has been so improved and changed that the original type, with its peculiar deep blue flowers, is almost lost in the large number of newer varieties, both single and double, that have been introduced during the past few years. Some of these when grown in large masses are extremely effective, and have the additional advantage of remaining in bloom for a very long period.

Sow the seed in October in the open ground. They thrive well in any good garden soil, but must be kept liberally supplied with water.

SPHENOGYNE. Nat. Order, *Compositæ*

A small group of very handsome annuals, which thrive well in the hills, but can never be cultivated with any success in the plains. Plants are easily raised from seed sown in October, and thrive well up to the commencement of the hot season, when they invariably die off without producing a single flower.

STOCKS (*Mathiola*). Nat. Order, *Cruciferae*.

This, which is one of the most popular flowering plants in Europe, unfortunately in Bengal, or at least in the vicinity of Calcutta, can never be grown with very satisfactory results.

The seed germinates freely, and the plants grow vigorously up to the blooming period, and then obstinately refuse to proceed further. Some attribute this to the ravages of a minute kind of insect, but whether such is the case, I think there is a considerable doubt. In the North-West and Punjab there is but little difficulty in growing really fine specimens of all the earlier flowering kinds.



STOCK, GIANT PYRAMIDAL.

they require a light open soil, well enriched with old manure. They must be kept well supplied with water, and an occasional drenching of liquid manure will much increase the vigour of the plants. There are a large number of varieties, both of the Perpetual and Ten Week Stocks. The latter, however, are the kinds that there is the greatest probability of growing with a fair amount of success in the plains but in the Hills all thrive equally well.

SUNFLOWER. See *Helianthus*

SWEET PEA.

(*Lathyrus odoratus*)Nat. Order, *Leguminosæ*

This beautiful old annual is so well known as to need no description, for it is certainly one of the most popular flowers in cultivation and deservedly so, for there are but few plants with such a wonderful variety of colour, and at the same time so easy to grow, seed should be sown in the place where the plants are to remain, they require a good rich soil and plenty of moisture. During the past three or four years a vast number of new varieties have been introduced, remarkable not only for large size but also for brilliancy of colour.



SWEET PEA.

SWEET WILLIAM.—(*Dianthus barbatus*)Nat. Order *Caryophyllaceæ*.

This old fashioned garden flower is popular everywhere, and has been wonderfully improved during recent years, it requires the same treatment as *Dianthus*.

TAGETES. (Marigold) Nat. Order, *Composite*.

The Marigold is held in so much esteem by our Hindoo mālees that they too frequently, on their own responsibility, overcrowd our gardens with it, so much so that owners are frequently compelled to order its extermination altogether. A few plants in a mixed border may go far to enliven a garden, but

when grown to excess, their glaring colours have the effect of entirely neutralizing the beauty of the many other annuals that may be growing near them.

T. erecta, the African Marigold, is the kind so much grown here. Of this there are now several varieties in all shades, from the palest yellow to the deepest orange, some of them of an immense size, with flowers upwards of six inches in diameter. There is also a new variety with quilled flowers, *T. erecta fistulosa* which is a great acquisition.

Seed should be sown in pans in July and August, and put

out when about three inches high; they will commence flowering in November, and continue to bloom freely through the cold season. *T. patula*, the French Marigold, is quite distinct from the preceding, being dwarf in habit and bearing flowers peculiarly striped, or spotted, with various shades of orange and brown. The new dwarf varieties make very effective bedding plants; they should be cultivated in the same manner as the preceding.



SWEET WILLIAM, SINGLE.



AFRICAN MARIGOLD, ELDORADO.

THUNBERGIA. Nat. Order, *Acanthaceæ*.

A small group of extensive climbers. In Europe most of the varieties are grown as annuals, but in this country they are most easily cultivated as perennials, and the little care required to save them through the rainy season is amply repaid by the splendid specimens they make the second year.

Seed should be sown in October or November, in light sandy soil; it is advisable to soak the seeds in warm water for three or four hours before sowing.

TORENIA. Nat. Order. *Scrophulariaceæ*.

Torenia Fournieri, is undoubtedly one of the handsomest annuals we possess, especially for pot culture, for which purpose it appears peculiarly adapted, as it invariably thrives better so grown, than if planted out in beds or borders; seed should be sown in June or July, and as soon as they are large enough must be transplanted, three plants in a six inch, or five in an eight inch pot will be found quite sufficient to produce good specimens, the pots in which they are grown should be kept continually standing in saucers of water.



TORENIA FOURNIERI.

TROPÆOLEUM. Nat. Order, *Tropæolaceæ*.

Tropæoleum Canariensis or *T. Peregrinum*, the well known Canary creeper, is undoubtedly one of the most beautiful climbing plants in cultivation. For festooning trellises, arbours, &c., it is unsurpassed. In the plains, seed should not be sown until the cold weather has fairly set in. In the Hills sow in April.

T. Lobbianum is another beautiful annual species with flowers of various colours, and of very vigorous growth, seed should be sown where the plants are to remain.

THE VERBENA. Nat. Order, *Verbenaceæ*.

The Verbena is undoubtedly one of the most useful bedding plants we possess in this country, being not only of a hardy constitution, but thriving well under almost any circumstances, and producing their brilliant hued, diversely coloured flowers more freely than almost any other plant we could name. This plant is, properly speaking, a perennial, and can with care be kept from year to year in a thriving condition, provided it is grown in a well



AURICULÆFLORA.

raised position, where there is no possibility of water stagnating at the roots, and in a good light, porous soil; not that I recommend this system of culture—at least in the plains—for there is no questioning the fact that neither old plants nor even young plants raised from cuttings or layers, ever produce flowers of equal quality to those borne on young healthy seedlings. I have for years adopted the practice of treating the Verbena as an annual, and with unvarying success.

There is little difficulty in raising Verbenas from seed if only the right method be adopted; and it need scarcely be stated, that he who sows should take care only to operate with seeds likely to produce appreciable results in point of quality. Seed may be sown at any time from the middle of September to the



VERBENA, DWARF COMPACT.

end of October, or even later; I prefer, however, to make all sowings by the first week of October: this ensures the plants a long blooming season before the hot weather sets in. Sowings should be made in pans of light moderately rich soil under shelter,

and they should be kept entirely in the dark until germination takes place, which will generally be in eight to ten days, when they must be gradually inured to the light, but not to direct sunshine. If the seedlings have come up too thickly, prick them out into other pans as soon as they have made their first pair of perfect leaves, placing them about three inches apart—or if space is available, a better plan is to put them singly into three-inch pots, in which they may remain till they are large enough to be planted out. It must be remembered that the *Verbena* loves a well-enriched soil, and in preparing beds for them a layer of at least three inches of very old cow manure should be worked into the soil to a depth of at least nine inches. In planting, do so firmly, and after the sun has lost its power in the afternoon, so that the plants may have time to get somewhat at home before the ordeal of a hot day comes on them. Shortly after growth has been commenced, a slight layer of sifted dung mixed with fresh soot placed over the surface of the bed, will, with occasional stirrings of the surface, make everything right in that direction. After pegging out the main shoots, and occasionally thinning weakly growths where overcrowding is likely to do the plants harm, and pinching off the trusses as they begin to go off, nothing more will be required. In the Hills sow in March or April.

Growing in Pots.—It may be thought by some that it is a mere waste of time and energy to grow *Verbenas* in pots, because they do so well generally in the open ground, but probably most of those who think so, have never seen *Verbenas* thoroughly well-grown in this way. Like other soft-wooded, quick growing plants, *Verbenas* should be carefully looked to with regard to a sufficient supply of water at all stages of growth, and to being re-potted directly a shift is required. Stunt the plants, which is easily done, and all your previous labour is thrown away. Ten or twelve inch pots will be found sufficiently large in which to grow good specimens, and the strongest and healthiest plants should be selected for the purpose. The following compost, I find, suits them admirably—4 parts very old cow manure, 2 parts mellow loam, 2 parts leaf mould, 1 part coarse sand, and a small quantity of finely broken charcoal to keep the soil open. With regard to the mode of training, it is difficult to have good symmetrical plants unless they are trained to some kind of frame: this may be of any pattern or shape to suit the grower, so long as the flowers can be displayed to the best advantage. Much however may be done by having the plants repeatedly pinched, in their younger stages of growth more especially, this will induce a bushy habit of growth which will not require the addition of many stakes to add to their general beauty. *Verbenas* are subject to all the ordinary insect pests and diseases so general amongst this class of plants, mildew being perhaps the worst in its general effects. Dustings of sulphur is

the best remedy as soon as noticed. The insect stock may be kept down by frequent syringing or fumigating with tobacco. Being gross feeders, Verbenas must be liberally supplied with manure water immediately they become established in their blooming pots. Where flowers are required for exhibition, the

number of trusses on each plant will require to be thinned out so as to throw the strength of the plant into perfecting those left. Another very necessary item in the management of the plants at that period is to shade from sunshine, and to endeavour to keep the first opened pips on until the centre ones have developed.



WALLFLOWER, DOUBLE

annuals in the place where the plants not bear transplanting well.

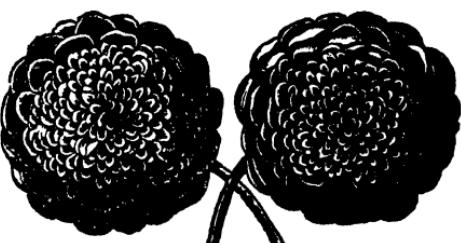
WALLFLOWER, (*Cheiranthes cheri*) Nat. Order, *Brassicaceæ*.

This old favorite cannot be grown with any measure of success in Lower Bengal, and yet in the North-West Provinces and Punjab it thrives exceedingly well, in the hills it is best grown as a perennial, for culture see Stocks.

WHITLAVIA. Nat. Order, *Hydrophyllaceæ*.

A very handsome annual, and one that should be found in every collection, thriving to perfection in this country. Seed should be sown in the open ground in October; they require a good light, rich soil and an abundance of moisture.

XERANTHEMUM.



XERANTHEMUM. Nat. Order, *Asteraceæ*.

A very fine family of everlastings, should be treated the same as *Helichrysum*.

ZINNIA. Nat. Order, *Compositæ*.

There is hardly any other annual that has been more improved either by natural or artificial hybridisation during the past few years than the Zinnia. But a comparatively short time since only the single varieties were known. Firminger, in his last edition published in 1874, states: "The double variety appears to have originated in this country, and is only met with having the flowers of one colour, crimson." Now we have them in almost every imaginable shade of co-



ZINNIA, ZEBRA STRIPED.

lour (except blue,) and as large and perfect in form as the Dahlia.

The Zinnia is especially valuable in this country, as it thrives and blooms at a period when but few other annuals can exist. Seed may be sown almost all the year round, but the best period is during June and July. It is advisable to sow them in pots or pans and put out in the border when about four inches high, watering them freely during dry weather. They thrive well in any good garden soil, and should be planted in a situation



ZINNIA, TOM THUMB.

fully exposed to the sun. As a rule most of the first flowers produced by the double varieties come single, these should all be carefully removed as soon as they appear. Amongst the newer forms now in cultivation, the Zebra Striped are well deserving of attention, these have however hardly become properly fixed yet, as the most reliable seed will rarely produce more than twenty-five per cent. of striped or mottled flowers, another class that is rapidly coming into favour are the Tom Thumb varieties, these vary in height from about eight to twelve inches, producing double flowers of fairly good size, they are well adapted for bedding. The new grandiflora varieties are a wonderful improvement on former types—the flowers of these under careful culture being of enormous size and perfectly double.



Part iv.

Bulbous Plants.

THREE is a strange charm about bulbous plants, arising probably from their peculiar sweetness and beauty, and also from the wonderful mystery of their lives, for as an old writer graphically puts it, "They are not always with us, they bloom, fade, and retire underground." This habit of retiring from sight when not in a state of beauty, no doubt enhances their value for cultural and decorative purposes. Like sensible visitors, they come when wanted, and far rarer merit still, go when not wanted. Most other plants are of necessity within sight all the year round. We take them in "for better for worse, for richer or poorer, in sickness and in health, till death do us part," and sometimes when they get very sickly and weedy looking we get tired of them. But bulbs hide away as soon as their beauty, fades, and are no more seen till a new life of verdure, beauty, and fragrance bursts forth again, when and where most wanted. The temporary rest of the bulb, is also most favourable to its transportation to a new place. It invites removal, and renders it safe and easy. Consequently Bulbs may be, and are, in fact by hundreds of thousands grown in one place or country and bloomed in another. Bulbs are also complete in themselves. The entire plant is packed up safely within a small compass. They have neither visible root, nor stem, nor flower, nor leaves, but the germs of all four are curled up within them. The whole of the appendages and products of growth are produced before the eyes of the grower who seems to wield creative power over the bulb, although its growth is simply but an unfolding of last year's light, air, and sunshine, and a presenting of the products in a new form or place to the delighted cultivator.

In the following short list of bulbous plants I have confined myself principally to those varieties that are usually grown from imported bulbs each season, and which are generally classed as Dutch Flower Roots.

There is probably no class of plants that has been so persistently shunned by gardeners in India as those which are generally described under this head. This is no doubt accounted for by the fact that almost every writer on Indian horticulture has pronounced, in the most emphatic terms, the impossibility of ever cultivating them with success in any part of India. But is such really the case? I should certainly, from my own experience, dispute the truth of such a statement, for I have flowered varieties of every species coming under this head with the single exception of the Tulip. This, I candidly admit, baffled every attempt to cultivate it satisfactorily in the plains. I strongly recommend those of my readers who have sufficient leisure, and, what is of far more consequence, take sufficient interest in their gardens to personally superintend them, to commence their experiments with Hyacinths, Alstroemerias, Anemones, Ranunculus and Oxalis. We have here some of the most gorgeously beautiful flowering plants in cultivation, and I assure them that if the following hints regarding their culture are carefully followed, success will certainly ensue. I do not for a moment wish to affirm that we should class these amongst plants that are "easily grown"—nothing of the kind, they will require careful and constant attention, and where this cannot be given they had better be left alone.

ACHIMINES.

The Achimines form undoubtedly one of the most useful and beautiful ornaments of our gardens, during the rainy season when we have such a scarcity of choice flowering subjects to adorn our plant-houses, it also has the advantage of being most easily cultivated. There are few plants that afford such a variety of form and colour, ranging as they do from the most brilliant scarlet to white and blue and many other shades too numerous to mention; while as to size and form, there is just as much diversity, some having long tube-shaped flowers (as in *A. picta*), and others flat and almost as large as a full blown Pansy.

Beautiful as they are when grown in pots, they are even more so when suspended in baskets, for which work their habit renders them peculiarly adapted, as they droop over in the most graceful manner possible and show off the flowers with which they are laden to the greatest advantage. In pots they require stakes or framework to support them, but in baskets these are rarely necessary, as they generally present a more effective appearance, trailing naturally over the sides, and the less formal they grow the better they look.

Those who are not so fortunate as



ACHIMINES.

quantity of water they require when growing, the pots must be well drained, which should be done by filling them up to a third of their depth. The next operation is to cover the potsherds with moss, cocoa-nut fibre or any similar material to prevent the soil blocking them up. The best compost for Achimenes is a mixture of good strong loam, leaf mould, and coarse sand, in equal proportions. In potting, place 3 to 6 tubers in a pot according to size, covering them loosely with the soil, but not in sufficient quantity to fill the pot, as they make better progress if afforded a top-dressing later on when they get into growth and begin to form fibres round their stems, a little fresh rich soil at that time being of the greatest advantage to them.

The baskets in which they are grown should be lined with moss and filled up with the same kind of soil as recommended for pots, and the plants afterwards arranged regularly round the sides by making holes with the finger between the wires in which to insert the roots, after which they should be hung up in any shady situation and kept well watered and syringed until they commence to bloom.

Many growers of these charming flowers commit the mistake of allowing them to dry down, or rather force them to do so by withholding water directly they have ceased blooming; the proper course is to keep their foliage fresh and green as long as possible, under which treatment they will develop large plump tubers, which will form the ground-work for success in future years.

to possess a few varieties of these very beautiful flowers, should at the proper season, that is from March to May, obtain tubers and start them at once in any close warm place where the soil will not become dry too quickly. They may be started into growth in any small pot or pan in finely sifted leafsoil and sand, in which they should be allowed to remain till they get an inch or so high, when they may be taken out and carefully separated for potting, or putting in baskets. Owing to the great

ACIS.

A small family of dwarf bulbous plants, the flowers of which somewhat resemble the Snowdrop in form; they will not thrive satisfactorily in the plains, but in the hills produce their pretty sweet-scented flowers in immense profusion. They are easily propagated by dividing old-established plants or from seed which the plants produce freely, but this must be sown as soon as it is ripe.

AGAPANTHUS.

A. umbellatus, or the Blue African Lily with its many varieties is undoubtedly, when well grown, one of the most beautiful of all bulbous plants. It is very rarely, however, that the plant is seen as it ought to be seen, and for the same fatal reason as has driven many other fine plants out of our gardens, because its treatment is but imperfectly understood. All the species of this family are stout-rooting plants, and consequently require a good rich soil, mixed with a liberal supply of well decomposed manure and coarse sand. They require an abundance of water during their growing season, but at the expiration of the rains this should be gradually withheld, giving only just sufficient during the winter to keep the foliage in a healthy state.

ALLIUM.



ALLIUM NEAPOLITANUM.

There are an immense variety of Alliums or flowering Onions in cultivation, the only kinds, however, that can be grown in the plains with any measure of success are *A. Album*, and *A. Neapolitanum*, bulbs of these planted in October or November in light, rich soil flower freely in February and March.

ALSTROEMERIAS.

How rarely one meets with these, and yet how beautiful and easily managed they are. For supplying

cut flowers there is nothing to equal them either for beauty or lasting qualities. Many of the best varieties rival some of the Orchids, which they closely resemble, both in the singular form of the individual flowers, as well as in their delicately marbled or spotted petals. The flowers, too, are of great substance, and as the stems are very open and soft, this accounts for their great lasting properties when cut. In the herbaceous border they are unrivalled, and a stand of cut flowers without Alstroemerias is

deficient in one of the choicest and most attractive of the many choice things belonging to that class of plants. Ample, thorough drainage, and a light generous soil with plenty of root room is all that is essential to ensure success in the cultivation of this lovely gem.

AMARYLLIS.

The original or true group of Amaryllis consists only of a few species represented in gardens by *A. belladonna*, *A. blanda*, *A. grandiflora*, *A. Josephine*, *A. pallida*, and one or two others. Now, however, the whole of the Hippeastrum family are almost invariably included with the Amaryllis, and as thus constituted is undoubtedly, with the exception of the true Lily family, the grandest genus of bulbous plants in cultivation.

Until the last few years their cultivation was almost entirely neglected. Now, however, they are amongst the most popular plants in European gardens, an immense number of hybrid varieties having been introduced—some of them of extremely brilliant shades of color, and others of an immense size, many of the fully expanded blooms measuring as much as eight to nine inches in diameter. The introduction of all these to this country would undoubtedly be attended with success; their cultivation being so extremely simple that failure is almost entirely out of the question.

From the time of their starting into growth they must be kept abundantly supplied with water till such time as the growth is completed, when less water should be given, and, as soon as the leaves become yellow, be withheld entirely. During the period of rest no water must be given, and the pots containing the bulbs may be stored in any cool dry place. The proper time to re-pot the bulbs is just before they start into growth, that is about the middle of January. The compost best suited to them is made of two parts light rich soil, one part leaf mould, and one part very old manure, with a small quantity of coarse sand. Flowering bulbs should be planted singly in pots of about six inches in diameter, and the smaller off-sets may be planted three or four in a pot of the same size. In potting the flowering bulbs one-half of the bulb may be left out of the soil, and they should be pressed in very firmly. The commoner varieties may also be grown very successfully in the open ground, giving them the same treatment as when cultivated in pots, except that, as soon as the foliage has withered, the bulbs should be carefully lifted and stored in dry sand till the planting season again comes round.

ANTHERICUM.

A small genus of handsome flowering plants bearing large Lily-like flowers, exceedingly free flowering in a cool climate, but in the plains are extremely shy of doing so; should be treated the same as Amaryllis.

ANEMONES.

Anemones are a highly ornamental class of easily cultivated

plants, with large flowers of nearly all shades of colours. They grow and flower well in any moist fertile soil, planted two to three inches deep and four inches apart. In the hills they may be grown in the open ground, but in the plains only pot culture should be attempted.

Cultivation of the Anemone.—Soil: For pot culture, use a compost of good loam, well-rotted cowdung, and sand, which should be well incorporated, and examined for the extirpation of wire-worm or other obnoxious grubs. For

border culture, any good garden soil will suffice, provided it be well drained and moderately light. For pots I prefer that they should be half filled with the above rich compost, then a layer of pure sandy loam, on which to place the tubers, and cover two inches deep with the same.

Time of Planting.—For a good succession, it is advisable to plant a few in September, the principal bulk in October, which will insure a succession of bloom up to the middle of June. In the Hills, if planted earlier than February the roots are liable to be injured by frost before they have commenced their growth.

BABIANA.

A small genus of very pretty bulbous plants suitable for growing in the Hills, pot in good rich soil early in November and keep well protected from frost during winter.



THE TUBEROUS BEGONIA.

Up to the present time but few attempts have been made in the plains to cultivate these beautiful plants, and unfortunately most of these have ended in failure, probably from the want of knowledge of the actual requirements of the plant. In course of time, however this will undoubtedly be overcome, and we shall most likely see the flowering varieties of this family even more popular than its other members, for there are no more real difficulties in the cultivation of the one than in the other. These Begonias may be grown by two methods—the first from Bulbs which may be obtained from most of our Hill stations early in November, but it is not advisable to pot them at once, a far better plan is to dry them thoroughly till early in December, then place the bulbs on a layer of damp moss or



BEGONIA, NEW STRIPED.



BEGONIA DOUBLE.

soil ; in a few days they will show signs of growth—and when they have sprouted about half an inch should be planted singly into six-inch pots ; the compost best suited to their requirements is one composed of two parts of rich light loam, two parts leaf mould, one part well-decomposed manure, one part sand, and one part cocoanut fibre refuse and if pieces of charcoal, instead of crocks, are used for the drainage of the pots, it will be found to increase

the vigour of the plants. After being potted they should be placed in a glass house or frame and kept as close as possible, watering them very sparingly the first few days, till they show signs of starting into growth when it may be given more freely. As soon as the plants are three or four inches high they should be watered with weak liquid manure every ten days till they commence flowering, which should be in about three months from the time of planting. If kept carefully sheltered from the midday sun they will continue flowering freely till the extreme hot weather sets in, when water should be gradually withheld from them, and the plants allowed to rest as soon as they are perfectly dry. The bulbs should not be disturbed, but stored in the pots in a dry godown or out-house, where they will remain without any further care till October, when they should be again started into growth in the same manner as mentioned above.

The second method—that of raising plants from seed—is one which, as a rule, amateur gardeners are very averse to, that is, when any alternative system results in any great saving of time. Seed sowing has, however, one or two advantages of its own, not the least of which is economy, for, from a packet of good seed, costing about a rupee, with moderate success, you should be able to raise more plants than could be got from bulbs costing probably twenty times the amount; then again, there is the interesting anxiety, dear to all gardeners who have any enthusiasm in their work, of watching the gradual development of plants raised from seed, always hoping, almost believing, that something new or novel must crown their efforts at last, and with such a subject as the Begonia, this is not at all improbable, for it is well known that it is just as sportive in its habit as the Geranium or Pansy, or even the Croton, of which it has been said that no two seedlings have ever been raised precisely alike.

The seed should be sown in September or October, in pans filled with light rich soil, made very fine and well watered. After sowing, the seed should be covered very lightly with fine sand and a piece of glass placed over the pan. This, again, should be covered with a piece of mat or any other material, so as to keep the seeds in darkness, the pans being placed in a close frame or house. After a week or ten days the shading should be removed, and as soon as the seedlings appear above ground, the glass must be taken off also. Water must be given with great care at first, as the plants are very tender and liable to damp off if kept too moist. By the end of November they should be ready for potting off singly into small pots, and as soon as they commence growing freely may be watered sparingly with weak liquid manure. As soon as the pots are well filled with roots, they should be shifted into a larger size, using the same compost as recommended for bulbs. By March or April most of them will commence flowering,

though, of course, not so freely or so fine as from bulbs of the previous season's growth. After flowering they should be dried off and treated as previously mentioned.

In the Hills, Bulbs may be planted at any time from March to June, seed should be sown in February or March under glass, and if well pushed forward many of the seedlings will bloom in October.

THE CALADIUM.

These are so well known that it is quite unnecessary to attempt to give any description of them. In point of colour it certainly claims precedence of all the other members of the Aroid family, though it lacks the noble proportions of the Dieffenbachia and the Alocasia. This, however, in all probability will be forthcoming in course of time, for some of the new hybrid varieties recently announced are described as having leaves upward of fifteen inches in length. The influx of new varieties seems to be never ceasing. There are supposed to be upwards of six hundred named varieties already introduced, but "still there's more to follow." The cultivation of the Caladium is extremely simple; the bulbs should be potted in a good rich soil as soon as they show signs of starting into growth. This will generally be by the commencement of March. They should be kept in a shady position and liberally supplied with water. As soon as the foliage shows signs of withering, water should be gradually withheld, and the plants allowed to die down entirely. When they are quite dried off, the bulbs should be removed from the pots and kept in thoroughly dry sand, until the time comes round for repotting them again.

CALLA OR RICHARDIA.

Calla Aethiopica—A very fine Aroid, having luxuriant, dark green arrow-headed leaves, and bearing immense pure white flowers during March and April. After flowering, water should be withheld till the foliage has quite withered, and the plant allowed to rest till November or December, when it should be again started into growth.

Calla albo maculata.—This is of precisely the same habit as the above, but the leaves are marked with transparent blotches of clear white, rendering it a very attractive object even in the absence of its white flower spathes which are produced freely.

CALOCHORTUS.

The Calochortus or Mariposa Lilies are now becomming exceedingly popular both in Europe and America, I am not aware of their ever having been grown successfully in the plains; in the hills, however, they flower very freely, they require the same treatment as Alstroemerias.



CHIONODOXA LUCILLE.

Convallaria majalis Hills if treated in the same way as recommended for Hyacinths, in the plains, however, it is very difficult to manage them with any degree of success. The only method by which they can possibly be induced to bloom in to procure English grown crowns or bulbs which are specially prepared for forcing, these should be planted three or four in a six inch pot, stand them in a cool shady position and cover with about six inches of cocoa nut fibre or any other light material, in a month or six weeks they should begin to show signs of life when the covering should be removed and plenty of light given, but avoid direct sunshine.

CHIONODOXA.

Chionodoxa Lucillae, is one of the most beautiful little bulbous plants in cultivation, flowers intense bright blue, freely produced on stalks about a foot high, they should be planted early in November and kept in a cool shady position, as soon as they are well above ground water liberally, they will flower in March or April.

CONVALLARIA.

or Lily of the Valley blooms freely in the



LILY OF THE VALLEY.

CROCUS.

None of the many beautiful varieties belonging to this family



CROCUS.

in fact many of them are natives of Bengal. They do best when planted out in the open ground, and will require no care or attention beyond being liberally supplied with water during the dry season.

DAFFODILS.

The many beautiful varieties of this old favorite can rarely be induced to bloom in the plains. In the Hills the bulbs should be planted early in November, they require the same treatment as Hyacinths.

THE DAHLIA.

There is probably no plant in cultivation that has been more buffeted about by the vagaries of fashion than the Dahlia—at one time almost rivalling the Rose in public estimation, after a brief period of popularity



DOUBLE DAFFODILS.

can be grown successfully in the plains; in the Hills, however, they flower to perfection. Bulbs should be planted early in November, during severe weather they should be covered with two or three inches of litter or manure this will effectually protect them from frost.

CRINUM.

An extensive genus of very handsome flowering plants, all of which grow to perfection in the plains;

sinking into comparative obscurity, and again when some other favourite for which it had to make room has been discarded, perhaps rising to a more pre-eminent position than it had previously attained. The most startling revolution, however, that has taken place in the Dahilia family is the re-introduction of single varieties into cultivation, and more astonishing still, is the immense degree of popularity to which they have attained. After half a century or more had been spent by many of the leading florists in Europe in endeavouring to bring the Dahlia to the highest state of perfection, filling the flowers so full of petals that it would be almost impossible to fill them fuller, by a sudden stroke of fashion's fairy wand all this work is undone, and we are brought back to the point from which our forefathers started at the commencement of the present century, and it is a strange fact that one of the most popular types of single Dahlias now in cultivation is an exact counterpart of one of the two original species from which all our cultivated varieties have descended. No one can deny that single Dahlias are extremely beautiful, but, on the other hand, even their most enthusiastic admirers would not care to assert that they in any way eclipse the double varieties ; and there is no doubt that the latter will remain *nulli secundus* long after the single varieties have again sunk into oblivion.

In all our Hill stations the Dahlia thrives most vigorously, so much so that large patches of them are often seen growing wild and uncultivated, undoubtedly owing their origin to seed that had been carried by the wind from some garden close by. In Bengal the great difficulty has always been to procure tubers in proper condition for planting at the right season.

Some advocate the cultivation of tubers procured from any of our hill stations in October or November ; but this course is rarely attended with success. This is due to the fact that the plants have then but just completed their season's growth, and without their natural period of rest cannot be expected to start again with any vigour.

It is a well-known fact that all dry bulbs and tubers, though apparently in a dormant state, are in reality not so, but that during this period of apparent rest there is a continual series of changes going on, gradually maturing them for their future growth. If this period of rest is denied them, or if it is lengthened to an unnatural extent, it necessarily follows that failure must be the result.

Probably the easiest and generally the most successful way of growing them in the plains is from seed ; this should be sown in September or October, in pots or pans of light rich soil, and as soon as the plants are about two inches high, they should be

planted singly in pots, or in a bed of good soil prepared in the same way as recommended for planting. If treated liberally, most of these will flower freely the first season. As a rule the flowers are very diverse in form, some being single others semi-double, and a few only perhaps double, and of nearly every imaginable colour. Neither the form or colour of the first season's bloom can be at all depended on; many of those which appear perfectly single the first year will, a second season, produce double flowers. It is therefore advisable to keep all seedlings over for trial a second season.

Storing the Tubers, this is a point that requires much more care than is generally bestowed on it. The plants should be kept growing to the end of April or beginning of May. Water should then be gradually withheld, and as soon as the stems are quite dry, the tubers should be carefully lifted, shaking all the soil from them, and allowing them to remain for a few hours in the sun to dry. Remove all the stem with the exception of three or four inches, and store them in perfectly dry sand or soil in boxes or pans. They must remain in a cool dry place all through the rains. If this is carefully attended to, they can be easily kept till the planting season again comes round.

In the Hills the Dahlia rarely receives the care and attention it so fully merits, the general impression appears to be that this is one of those good things that can be left to take care of itself, such however is far from being the case as I know of no plant that better repays good culture. Dahlias are greedy of water, and for that reason the ground on which they are grown should be porous and have a dry bottom, for they can only drink water up when in motion, and not when it settles round their roots in a stagnant state. After draining where needful, the ground should be trenched to a depth of 30 inches or 2 ft, for the Dahlia is a gross feeder and a deep-rooting plant. A good layer of from 4 to 6 inches of manure should be treched in, thoroughly incorporating it with the soil as the process proceeds. On poor soils it is hardly possible to over-manure Dahlias, and several inches of dung may be thrown into the bottom of the trench. All this should be done some time previous to planting, so as to afford time to allow any rankness in the manure to be destroyed or rather assimilated with the soil before planting. Having carefully prepared the ground, the next step is planting out, for which the plants need to be as carefully prepared as the ground for the plants. The best mode of planting is to insert the stakes first, the bulbous roots thus avoid any risk of being staked through afterwards. Unless the soil is specially good, give each plant a spadeful or two of rich porous compost under and around it on planting. The distance apart may range from 18 inches to 2 ft. for bedding Dahlias, to

3 ft., 4 ft., 5 ft., or even 6 ft., in the case of the strongest growing show and fancy varieties. Single Dahlias may be planted two to three feet apart, or closer where they are massed into beds, as they will bear any amount of pruning. The roots should not be covered to a greater depth than 3 in. or 4 in., and the stem of the plant should not be buried at planting more than 1 in. deeper than its collar, that is the point of divergence between root and stem.

EUCHARIS.

The old variety *E. Amazonica* is so well-known and so generally cultivated as scarcely to need any description here. In Europe it is considered one of the most beautiful of winter flowering plants, and under skilful cultivation a succession of bloom is kept up for a period of some months. Much difference of opinion appears to exist among experienced horticulturists as to the mode of treatment best adapted to the requirements of this plant, many advocating that the bulbs should be entirely dried off each season the same as an Amaryllis or Dahlia, and others as strongly urging that the plants should be kept in a vigorous state of growth throughout the year. Now in this country, if we were to abide by the hard and fast line of either system, the result, in all probability, would be a complete failure, and for obvious reasons ; for, if we adopted the drying-off plan, the first difficulty that presents itself is to start the bulbs into growth again, as at the proper season (December or January) the temperature is generally much too low for them to start with sufficient vigour to flower satisfactorily, and not one garden in a thousand possesses any facilities for forcing them. On the other hand, if we follow the other method, the result must be that the plants eventually exhaust themselves by the production of an excess of foliage. The culture best suited to them is to induce the plants by liberal treatment to grow as vigorously as possible up to the end of the rainy season, and then gradually withhold water from them, allowing just sufficient to keep the foliage from withering. This resting period, which should not be less than two months, will have the effect of thoroughly maturing the bulbs and pre-dispose them to flower ; for it is a well-known fact that nearly every genus of bulbous plants, during the period in which they are actually supposed to be dormant, are in reality gradually, but surely, perfecting their various organs for future development. About the middle of December commence again to water them freely, and as soon as they show signs of renewed vitality, give them a weekly dressing of liquid manure till the flowers appear.

FREESIAS

A small genus of dwarf sweet scented bulbous plants, flower-
ing profusely under good culture in the plains, the bulbs



FREESIA ODORATA

GALANTHUS. (*The Snowdrop*).

It is utterly impossible to cultivate this fine old favorite with any success in the plains. Bulbs may be imported in a perfectly sound condition, but they invariably refuse to start into growth. In the Hills however they thrive fairly well, bulbs should be planted in October, in a cool shady position.



DOUBLE SNOWDROP.

GLADIOLUS.

It is certainly strange that this beautiful bulbous plant has not become more popular in this country or rather in the plains, for in almost every district it can be grown with more or less success. In the plains the best time for planting is in October or November; they require a very light sandy soil well enriched with old cow manure. In the Hills they should be planted at any time from March to May, but the earlier during that period the better. The Gladiolus is also easily raised from seed, but it takes three years to produce bulbs sufficiently strong to flower well.

GLOXINIA.

The Gloxinia is undoubtedly one of the most beautiful plants in cultivation and they are by no means so difficult to grow as some would have us believe, on the contrary in the plains it is certainly one of the most easily managed of all the bulbous p'ans I am acquainted with, for, by judicious treatment and starting the tubers at different times, Gloxinias may be brought into bloom at almost any season of the year, in fact with proper management the same bulbs may be induced to flower twice a



GLADIOLUS GANDAVENSIS.

year; for instance, if planted in January they will flower by April, these may be dried off by the end of May and allowed to remain dormant till July, when they should be again started into growth and they will then flower again in October, but this system of forcing naturally weakens the bulbs very materially, and few of them can be kept growing at this pace for more than one or two seasons.



GLOXINIA.

Tubers may be obtained at any time from January to April, these if planted at once will bloom in about three months from the time they start into growth. One year old tubers are, as a

rule, not larger than a walnut but it will be better to have these, than larger and older specimens, which will not last so long or be so vigorous as young plants. The bulbs should be potted singly in small pots (four inch) at first, using a light open compost of good leaf mould, a little light loam, and a liberal portion of sand which should be as coarse in texture as possible. Crock the pots fairly well and press the soil moderately firm; the bulb should be just covered with soil, placing, of course, the eye or crown of the bulb uppermost; keep the soil only just moist until growth is well advanced. When fairly in growth, a very important point is to afford each plant as much light as possible which will have the effect of inducing a dwarf, stiff habit, and great substance in both the foliage and subsequent bloom. To attain this end it is always advisable to grow them in a glass house or frame, where such a structure is available, or an ordinary plant house, or even a cool position in a verandah will also answer provided they are shaded from hot sunshine and the pots placed on or directly over a bed of damp cocoanut fibre or moss, or near a tank of water, the great point is to maintain a moist, sweet atmosphere, avoiding draughts and sudden chills.

When the small pots are beginning to become full of roots a shift must be given, this time into 6 or 7 inch pots, preferably the latter, if good sized plants are required. In due time the flower buds will commence to rise and at this period an occasional dose of some sweet and clear liquid manure of moderate strength will greatly assist the development of the flower. An infusion of fresh cow manure or clear soot water is as good as anything, or a solution of sulphate of ammonia at the rate of one ounce to three gallons of water will be very beneficial. When in bloom plenty of water will be required; but never allow a drop to touch the flowers. Careful, but not heavy shading will tend greatly to prolong the blooming period. After flowering, the plants should be gradually dried off and the bulbs ripened by exposure to the air and sunshine.

HYACINTH.

Hyacinths in Beds or Borders should be planted in October or November. They do well in any light garden soil. Turfy loam, with a plentiful admixture of sand and well-decayed manure, is, perhaps, the best of soils for them; and if the natural soil be so stiff and adhesive as to require modifying, these are the materials that should be used. The bulbs should be planted with their crowns four inches below the surface, covering the ground after planting with two inches of loose pulverised manure. Hyacinths planted

out of doors seldom require any water, and if the soil or situation be at all damp they will do better if the soil in the beds or borders be raised an inch or two above the surrounding level; this method of growing Hyacinths is well adapted for Hill Stations, but should not be attempted in the plains.

Hyacinths in Pots may be potted from September to Christmas, in order to secure a succession of bloom. October is, perhaps, the best time for potting the mass. If new pots be used they should be soaked in water before placing the soil in the pot. Fill the pots with the same compost as recommended for "Hyacinths in Beds." 5 and 6 inch pots are the sizes ordinarily used. In potting, one-third of the bulb should be left above the surface of the soil, and the pots should be placed on the level ground out of doors, having previously taken the precaution to prevent the ingress of worms through the holes at the bottom of the pots. Cover the crown of each bulb with a small pot, and the whole with six inches of cinder ashes, coarse sand, or any porous material, leaving them so covered for at least a month, then removing them at intervals as required to a cool frame or house. As the leaves expand place the pots close to the glass; give plenty of air, and attention must be paid to watering; and as the foliage and trusses advance, occasional waterings of liquid manure is very essential. When the blooms begin to expand, the temperature may be gradually lowered; and when fully expanded, the plants may be taken to a cool house or room where there is plenty of light.

Hyacinths in Glasses may be put in, in October or November. The bulb should be placed, in the first instance, with the lower end



SINGLE POTS HYACINTH.

not quite in contact with the water. Pure rain or pond water should be used, and not changed unless it becomes offensive. When the bulbs are placed in the glasses, they should be placed in a dark place for about a month, then gradually inured to the light, filling up the glasses as the water diminishes. The bulbs will flower in the greatest perfection if placed in a cool airy situation, well exposed to sunlight, but it is usually desirable to place some at least in a warm situation, to accelerate the period of flowering.

HYACINTHUS CANDICANS.—Those who have not yet got this Hyacinth would do well to add it to their collections, as unquestionably it is one of the finest hardy bulbs we have. It throws up stout flower-stems from 3 ft. to 4 ft. high, the top portion being clothed with large white funnel-shaped blossoms. As a pot plant it is very effective, and of great value mixed with others on a stage, where, with the flower-heads clear above the foliage, it has a striking effect. Being of rather strong growth, and making a good deal of root, it requires plenty of pot room. It should have rich sandy soil to feed on, and during summer plenty of liquid manure, which will help it to form fine leaves and to bloom well the year after. When grown in borders it should be planted about 6 in. deep and have some sand placed around the bulb, the sand being a good protection against rot. As it seeds freely, plants of it may be raised in that way, but it takes some years to get the young plants strong enough to flower.



HYACINTHUS CANDICANS.

IXIAS.

These beautiful plants are universally admired for their graceful and elegant style of growth, and ought to be more extensively grown on account of their richness and contrast of colour. In the Hills they may be cultivated in beds or pots. The beds should be raised about six or nine inches high in a warm situation, well drained. Plant the bulbs in October, four inches deep, with a little sand round each, then cover with fine soil. If cultivated in

pots, plant four or six in a pot, two inches deep, with some good fibrous loam, leaf-mould, and sand; place a little sand over the bulbs; press the soil firmly down and fill up the pots with soil; water freely and plunge the pots in ashes. The latter method is best adapted for Bengal.

LILIUM.

If we were to search the whole vegetable kingdom through,



LILIUM SPECIOSUM.

we should probably hardly be able to find a genus of plants so universally popular as the true *Lily* tribe; for, whether we take the old *L. candidum* or *longiflorum* in all their purity, the gorgeous *L. auratum*, or *L. Szentivánium*, or the majestic *L. giganteum*, where can we find their equals? Should there be any among my readers who have ever had the good fortune to see a group of *Lilium giganteum* in flower, growing wild in its native habitat, (and it is to be met with within a short distance of one of our most popular hill sanitaria) they, I am sure, will agree with me, that it is one of the most magnificent objects they had ever beheld.

With the exception of *L. longiflorum* and *L. tigrinum*,

the cultivation of this beautiful genus is but rarely attempted in the plains; and yet there are many species that may be induced to thrive most satisfactorily, and with much less care than is frequently bestowed on plants of inferior merit. The great difficulty is to import bulbs in really a sound condition, for most of them cannot survive being kept a long period out of the ground. They should arrive here not later than the first week in November, and must be potted at once, using a compost of good loam, leaf mould, cocoanut fibre, and coarse sand well enriched with old cow manure. Great attention must be paid to secure perfect drainage. The pots should be filled at least one third with broken crocks, and over this a layer of coarse charcoal should be placed. From one to three bulbs may be planted in each pot, which should

be kept in a shady position, and water must be very sparingly applied till they commence growing freely. They may then be watered liberally, and occasional dressings of liquid manure and soot water must be given. The plants should be kept in a position where they will get the morning sun only ; after flowering, should the stems show signs of withering, water should be withheld ; and as soon as they have become thoroughly dried off, the pots should be kept in a cool dry position till about the middle of October, when they must again be started into growth.

Planting—As soon as Lilies have done blooming they may be lifted and transplanted safely ; but it is far better to delay interfering with them till the stems have died down ; from which time, and till just before they begin to grow afresh, is the proper season to shift and plant them. Lily bulbs should be planted some 6 in. to 12 in. deep, according to their age, size, and kind. In light ground the depth may be greater ; in heavy, less. Californian Lilies, especially, should be planted very deep. In planting carefully observe that no piece of manure comes in contact with the bulbs, else rust and rot may ruin them. It is not well to keep Lily bulbs out of the ground and in a dry place for some weeks or months as you would a Hyacinth or Tulip ; they are not solid bulbs, but scale bulbs, and suffer much by such exposure. If of necessity they must be kept unplanted, pack them in sawdust, sand, earth or leaf mould ; and if you desire to send them from one place to another, sawdust is about the best thing you can pack them in.

In the Hills almost every species of Lily can be grown most successfully, the best time to pot them is early in January (except *L. candidum* which should be repotted early in November) the bulbs will probably make no signs of growth till about the end of March when, as soon as the stems have attained a height of about 6 inches they should be put into their blooming pots.

LEUCOJUM.

L. aestivum or "Summer Snowflake," and *L. cervum* the "Spring Snowflake," produces white flowers which in form much resemble the Snowdrop, but are considerably larger; not cultivated with any success in the plains.

NARCISSUS.

A large genus of very beautiful flowering plants, nearly all of which are natives of Europe, and include amongst them the

old favorite "Daffodil," "Jonquil," and "Hoop Petticoat."



NARCISSUS POETICUS, DOUBLE.

deep. Water should be very sparingly applied till they make a start, but when growing freely will require abundance of moisture.

In the Hills where almost every member of the family grows very luxuriantly, they should be treated the same as recommended for Hyacinths, complaints are often made that the bulbs do not flower well after the first season, but this is as a rule owing to wrong treatment, the great point is to thoroughly ripen the bulbs and then give them as long a resting period as possible, when this is done they never fail to bloom freely.

OXALIS.

The genus *Oxalis* contains many beautiful objects, which I am sure, only require to be better known to bring them into general favour and cultivation; with the exception of *Bowiei* and *Deppei*, they are scarcely known. They are nearly all neat growing and of simple culture, luxuriating in a mixture of sandy peat and loam.

PANCRATIUM.

A small group of very free-flowering bulbs, of easy culture. Most of the species have large handsome flowers, which are deli-

Unfortunate, however, but very few members of the family can be cultivated with much success in the plains. Some of them may occasionally be induced to produce a stray flower or two, but these cannot be compared with the vigorous beauty of the blooms produced in a cool climate. Firminger mentions that *N. Jonquilla* and *N. Tazetta* had been cultivated with success in Calcutta, but I have never yet seen a good specimen of either except in the Hills. They should be grown in a very light rich soil, and must be planted from three to four inches

ciously fragrant, and continue in perfection for some considerable time after they open. *P. Carribeum*, *P. maritimum* and *P. parviflorum* are occasionally to be met with in our gardens. *P. viridiflorum*, a recently introduced species, is a peculiar and distinct variety, producing a scape several feet high, bearing an umbel of five or six large bright emerald green flowers.



NARCISSUS POLYANTHUS.

POLYANTHUS NARCISSUS.

Should be planted in September and October. Its general treatment is similar to that of the Hyacinth. For early forcing the *Paper White* and double *Roman* are very useful, and when potted early in September, produces a profusion of bloom by Christmas. *Bazelman Major*, *Soleil d'Or*, *Staten General* and *Gloriosa superba* are all exceedingly beautiful varieties, producing large heads of bloom.

RANUNCULUS.

Among dwarf flowers the *Ranunculus* is unrivalled for its lovely form and its brilliant and attractive colours, white, crimson, yellow, purple, and black. They present nearly a round of the most gorgeous colours, combined with a compactness and symmetry unequalled in any other flower. The individual flowers are about two inches in diameter, beautifully imbricated and as full and double as the finest Camellia or Rose. No Florist's flower is so rich in distinct and brilliant markings. They must be grown in a cool shady position, using a light rich soil, planting tubers about two inches deep and 3 or 4 inches apart in the pots.

SPREKELIA.

Very closely allied to Amaryllis, and are frequently grouped with them. Culture the same as for that genus.

RANUNCULUS, DOUBLE FRENCH.

S. formosissima.—The "Jacobea Lily" has bright crimson flowers shaded with numerous golden dots; makes a good specimen



in pans with from three to six bulbs in each ; can also be grown in glasses the same as Hyacinths.

S. Glauca.—Similar to the preceding, but instead of crimson it is a bright scarlet, the petals having a narrow white stripe down the centre and occasionally margined with white.

STERNBERGIA.

S. lutea.—A very handsome little plant, bearing at the end of the rains its bright golden yellow flowers in great profusion. This is also known as *Amaryllis lutea*, and is supposed to be the "Lily of the Field" of the Bible.

THE TULIP.

There is certainly scarcely any other plant that has a more interesting history than the Tulip; for, though it has never enjoyed the universal and lasting popularity of such plants as the Rose, Violet, or Geranium, it at one time caused a greater sensation than any other member of the whole vegetable kingdom, the speculation in bulbs being for a period of two or three years in Holland almost a national mania, and nearly as disastrous in its consequences as the South Sea Bubble was in England. It is recorded by Munting that for one bulb of a variety called "Viceroy" the following articles were offered : namely, two lasts of wheat, four lasts of rye, four fat oxen, three fat swine, twelve fat sheep, two hogsheads of wine, four tons of beer, two tons butter, one thousand pounds of cheese, a bed, a suit of clothes, and a silver beaker, the aggregate value of these articles being two thousand five hundred florins. In 1636 Henry Munting sold to a merchant at Alkmaar a Tulip root for seven thousand florins, but before it could be delivered the price had fallen, and by agreement the merchant paid 10 per cent., so that Munting pocketed seven hundred florins for nothing. One man made by this trade a little fortune of 60,000 florins in the course of four months. The speculators included noblemen, farmers, pedlars, tradesmen, sailors and chimney sweeps,—in fact men of every station in life. They knew nothing and cared nothing for Tulips and they very rarely saw the bulbs they traded in,



SINGLE TULIP.

and probably many were bought and sold that never existed, the names only serving as an object for speculation. Unfortunately, like too many other beautiful plants belonging to the Liliaceous order, the culture of the Tulip in the plains is utterly hopeless, and even in the hills, although they may occasionally be induced to flower, are almost invariably poor, sickly, colorless things, quite unlike the highly-colored vigorous blooms they produce in a climate adapted to them.

The routine of pot culture is practically the same as for Hyacinths, but for the earlier varieties three or five bulbs may be placed in a 6-inch pot, the later kinds and larger bulbs are best placed singly in 4-inch pots.

VALLOTA.

V. purpurea, or "The Scarborough Lily," a well-known plant in European gardens, where it produces in profusion its gorgeous scarlet flowers. Unfortunately, however, it can never be induced to produce a single flower in the plains.

ZEPHYRANTHES.

Very beautiful little flowering plants, so extensively cultivated and well known in this country as hardly to need any description here. They are frequently employed for the edgings of borders, and are well adapted for that purpose. Their deep green grass-like foliage being very effective even when out of flower, but when in bloom in large quantities, with the colors blended together, their appearance is brilliant indeed. They are very subject to the ravages of caterpillars, and should be carefully watched to keep them free from these pests.



Part v.

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Monthly Operations for the Plains.

Necessarily notes under this head can only be suggestive of what may be, or what requires to be done at certain seasons of the year, and they are intended to serve as suggestions rather than models for strict imitation. Every garden has its own special requirements at certain seasons, leaving out of account the difference in weather or climate in various parts of the country ; so that after taking into account circumstances and conditions, each for himself must decide as to what extent the hints and directions here given should be carried out.

JANUARY

THE VEGETABLE GARDEN.

Successional sowings of Peas, Beans, Lettuce, Cress, Mustard and Radishes should be made at regular intervals.

The first crop of Celery should now be ready for earthing up ; this is an operation that requires careful attention, see that the soil is not too dry, otherwise it will find its way into the hearts of most of the plants, and consequently spoil the shape of the sticks.

Keep the hoe continually moving amongst all advancing crops ; this frequently tends more to the production of good vegetables than very heavy dressings of unctuous manures. We too frequently see vegetable gardens in a most neglected state, seeds being simply sown or plants merely stuck in the ground without any further preparation whatever than being dug over to a depth of about six inches ; and after this, with the exception of an occasional watering they are left to take their chance, and eventually become almost entirely choked up with weeds and grass. It is owing to gardening of this description that we hear so many complaints about the impossibility of growing good vegetables.

THE FLOWER GARDEN.

A final sowing of Nasturtiums, Mignonette, Candytuft, French Marigold and Convolvulus major should now be made.

Pansies, Asters, Cinerarias, and German Stocks should now be transplanted into their blooming pots, using richer soil than what they had been growing in previously.

Aloysia citriodora, Verbenas, Heliotrope, Carnations, Geraniums, and Pansies now strike readily from cuttings.

Chrysanthemums.—Cuttings should be taken of Chrysanthemums, stout short suckers of about 3 inches in length, taking them off with about an inch of root stem, and inserting them singly in 3 inch pots ; turf loam with a fourth of leaf soil, well-decayed manure, and a sixth of sand answers. Three cuttings may be inserted in a 4 inch pot ; place the pots on ashes in a cold frame, shading from bright sun, and after the cuttings begin to grow ventilate the frame freely. The single plants will answer for growing in 9-inch, and the trebles for 12-inch pots.

Conservatory.—Ornamental Foliage Plants, such as Crotons, Dracæna, *Panax*, etc. should be syringed at least once a day. During the cold season the operation shold be performed in the morning two or three hours after sunrise. On no account water them in the evenings as by so doing we materially reduce the temperature just at a time that the plants require most warmth. It is generally the neglect of this precaution that leads to the loss of foliage we hear so many complaints of at this season of the year.

FEBRUARY

THE VEGETABLE GARDEN.

LATE PEAS should have a ridge of soil drawn on each side of the row, and within 2 inches of it, so as to confine the water, which should be applied without stint, or it will be impossible to keep them from becoming a prey to mildew. One good drenching, so as to moisten the soil down as deeply as the roots descend, will be of more service than six partial applications. Scarlet Runners must be similarly treated, or the produce will not only be small, but the bearing capabilities will be so far reduced that the blooms will refuse to set at all. These and all other crops will be much benefitted by mulching 3 inch thick with littery manure. If the land be at all poor, nothing is better than to use it fresh from the stable, laying it on before the water is given. By this means the fertilising elements of the manure are immediately washed down to the roots of the crop, upon which they at once act beneficially.

CELERY, more than most crops, will now need to be well soaked with water ; if the varieties grown are such as are at all inclined to run to seed, they are sure to go off in this way if not watered before the plants flag. After a good soaking 1 in. or 2 inch of soil may be put to even the late crops ; it will protect the roots, which lie close to the top and are still further encouraged to the surface by watering, from being so soon dried up, and will diminish evaporation.

DWARF FRENCH BEANS.—Where these are held in estimation, and are required to keep on bearing as late as they can be had, those that were sown late must have the first Beans they produce picked off as soon as they are fit for use, or their ability to continue making the necessary growth will be curtailed ; to assist them in this, good soakings of manure water will be found the most effective, for even where the ground has been well enriched with solid manure liquid stimulants are of service by acting immediately upon the roots.

Late-sown Turnips should now be well thinned, for if at all overcrowded they make little else than tops. Onions and Carrots must also be thinned out, so as to leave them sufficient room ; if this be not attended to in time especially in the case of Carrots, they never grow to a useful size.

The American varieties of Water Melon may now be sown.

THE FLOWER GARDEN.

CHRYSANTHEMUM cuttings struck last month will by this time be well-rooted and hardened off ; they should be at once moved into 6-inch pots, using ordinary loam made rich with one-third rotten manure and leaf-mould in equal proportions, to which a little sand has been added. There is no grosser-feeding plant in cultivation than the Chrysanthemum. To grow it successfully the soil must be rich, and in its early stages it must never be allowed to become pot-bound, for if this occurs no after treatment will ever impart to the plants their wonted vigour, as the stunted condition the roots get into when confined in little pots has the effect of prematurely hardening the shoots.

CALADIUMS.—A few Caladiums should now be started ; if they have been allowed to rest for some time, they ought to be shaken out of the old soil and re-potted in fresh material ; they succeed best in good loam, with a little leaf-mould and some sand added.

MARCH

THE VEGETABLE GARDEN.

DRYING HERBS.—Herbs should be gathered as soon as they begin to open their flowers. In drying them two methods are employed. One is to tie them into bunches as soon as cut and hang them up in a room or shed ; the other is to first lay them out in the sun to dry. By both these methods the quality is deteriorated. If fermentation takes place sufficient to discolour the leaves—such as occurs, more or less, when herbs are tied up in bunches whilst green and sappy—their best properties are destroyed. In confirmation of this it is only necessary to point to the extreme care taken by the growers of Lavender, Mint, &c., for distilling ; for such purposes they are not allowed to lie together, even for a few hours. If, on the other hand, herbs be exposed to the sun, much of their strength is dissipated ; they become quite brown, and the fresh green appearance which they possess when the drying is well managed is destroyed. But when herbs have been improperly treated, loss of strength is not the worst result ; there is always imparted to them a disagreeable flavour. In drying herbs an open shed or room, where plenty of air can be given, is necessary. Stretch out a piece of netting, such as is used for protecting fruit from birds, wire netting if at hand will do ; on this lay the herbs (which should be cut when quite dry) thinly. Thus treated, air acts upon them from all sides and they dry quickly, which is the primary object, without losing their best properties. When perfectly dry put them loosely in white paper bags, tie them up, and hang them where they will be free from damp or they will become mouldy. Herbs treated in this way will be found to be but little inferior to such as are fresh cut.

Where Asparagus is grown, the beds will now require attention, for treatment see article on this vegetable.

Carrots, Onions, Parsnips and Beet by the end of this month will have completed their growth, they should be carefully lifted and stored for future use.

THE FLOWER GARDEN.

THE CONSERVATORY.—This department will now require our constant attention, plants that have been in a dormant or semi-dormant state for the past three months will now begin to make fresh growth, and will not only require liberal watering and feeding, but all that need re-potting should be shifted immediately ; they will then take hold of the new soil at once and grow vigorously the whole season. There is probably no part of the work in a garden that is generally so carelessly carried out by amateur gardeners

in this country as the re-potting of plants. In some gardens it is neglected altogether, and plants are allowed to remain for years in the same pots, in others, where plants are re-potted at all, pots quite out of proportion to the size of the plants are employed.

CALADIUMS.—These should now be started into growth ; where large bulbs are available, and it is desired to propagate from them, the best plan is to start them in shallow seed pans of pure sand, only covering the bulbs about half an inch. As soon as the eyes appear above the surface, the bulbs should be carefully lifted and divided into as many pieces as there are eyes, and potted at once in rich light soil. Alocasias and most other Aroidaceous plants will now be making a move. Plants that require re-potting should be shifted at once, and where a change is not required it is advisable to remove an inch or two of the top soil and fill in with a good rich compost. A mistake frequently made in cultivating this family is to treat them as if they were semi-aquatic plants, deriving all their vigour from the water supplied to them.

THE ROSE GARDEN.—This is the best season for propagating by layering : put down now, they will make strong healthy plants by the commencement of the rains, when they can be removed with safety. Select strong healthy shoots, with the wood about half ripened ; these invariably strike the best. Grafting or inarching on the Gigantea Stock may still be performed, but to insure their uniting quickly must be kept well supplied with water, and where, practicable, partially shaded. Where cuttings of Rose Edouard or the China Rose, *Duc de Brissi*, are available, these may be used as stocks for budding, which will now take freely.

APRIL

THE VEGETABLE GARDEN.

In this department but little work can now be done except to clear off all exhausted crops.

ASPARAGUS.—Must be watered freely and where the soil is poor, a liberal dressing of Liquid manure will prove very beneficial.

THE FLOWER GARDEN.

When required to flower early, some Achimines should now be started. The best plan with these is to procure some seedpans ; place a few crocks in the bottom of them, and over these lay the soil. The latter ought to be quite fine, consisting of ordinary loam sifted, to which one-fourth of leaf-mould and sand should be added. Out of a mixture such as this they can be removed to their blooming pots without breaking their roots. When they have made a couple of inches of growth they will be fit to pot off.

PASSIFLORAS AND TACSONIAS.—Most kinds of climbing plants will now be starting into growth, and many of them, such as Passifloras, Tacsonias, and others of that class, that flower on the young wood they make, must now be pruned in. The whole of last year's growth should be entirely removed, unless any portion be required for laying in to train over bare or vacant places. It is best, however, to do this by degrees, so as not to denude the plants entirely of their old foliage till some of the pruned-in part has just started, when the remainder may at once be cut away. This treatment will save any check the plant might otherwise receive if stripped all at once of its foliage.

CHRYSANTHEMUMS.—Those still in cutting pots should at once be potted off singly into small pots, and returned to a cool, shady position, and care must be taken that they are shifted again into larger pots before becoming root-bound. Do not pinch out the head at this stage unless bushy-plants are required; as standards are the easiest grown and give the best results. It is not yet too late to strike cuttings for this mode of culture.

MAY

THE VEGETABLE GARDEN.

Towards the end of the month make sowings of Indian Corn, Okra, Brinjals, Squashes, Vegetable Marrows and also the many varieties of native Vegetables grown during the rainy season.

THE FLOWER GARDEN.

GENERAL WORK.—Careful attention is requisite to preserve Fine Foliage Plants in good condition at this season, frequent sponging is of great importance, and as this requires much time, advantage should be taken of any cessation of work in the open air to do as much of it as possible. Woodlice, slugs and snails are also great pests among foliage plants, and as they are invariably busiest at night, it is an excellent custom to walk through the houses as late as possible to catch and destroy every one of the marauders that can be found.

FERNS.—Any plants that were not potted early in the season should now receive attention, providing good drainage and soil that will admit of the water passing freely through it. Plants with creeping rhizomes, as Davallias, Gleichenas, &c., should never be allowed to suffer from having their stems injured, as they will if they are allowed to extend over the rims of the pots.

MARANTAS.—These should now be starting freely into growth, and must be repotted in a rich loose vegetable soil, consisting principally of well rotted leaf mould, good fibrous loam and a very little decayed manure and sand. Pot moderately loose in well drained pots, which should be of rather large size to give them plenty of root room. Marantas are shade-loving plants, and must therefore not be placed where the sun shines fully on them.

ALLAMANDAS.—Where these have made very long straggling growth without showing flowers, they may have their points nipped out: the shoots should then be trained regularly over a trellis, bringing the points low down. This will cause a quantity of the back eyes to break that in due time will show bloom. See that the plants are liberally supplied with manure water at intervals of about a week.

ROSES.—Tea Roses in Pots that have been flowering for some time will, if strong, yet keep on making wood that will yield flowers, but to have them of good size and sufficient quantity the plants must be regularly and liberally fed with rich surface dressings. Where any falling off occurs in this matter the after growth will come too weak to flower, or if a portion of it does bloom, the produce will be thin and poor. It rarely happens that pot Tea Roses yield nearly the quantity of flowers of which they are capable through want of liberal feeding. The nature of these Roses is to keep on all but continuously growing, and unless they receive a regular and liberal supply of manure in either a solid or liquid form, they neither increase in strength nor produce flowers in abundance.

JUNE

THE VEGETABLE GARDEN.

In this department nothing can be done beyond making successional sowings of the vegetables mentioned last month.

THE FLOWER GARDEN.

RE-POTTING.—If not already done, Palms and other ornamental Plants should be re-potted or top dressed according to their necessities. For the majority a mixture of loam, leaf mould and a liberal proportion of silver sand will be the most suitable. The pots used should be perfectly clean.

PLANTS IN SMALL POTS that have their leaf surface large in proportion to the amount of soil in which they are grown, will require constant attention as to water, of which a frequent supply, sufficient to saturate the whole of the soil, should be given, as they invariably suffer more from a scarcity of water than those plants whose foliage-surface is more limited.

ACHIMINES.—The last batch of these already growing thickly in pans should be separated and placed about 3 inches apart in their flowering pots or baskets. Keep them well exposed to the light, so as to prevent them becoming weak and drawn, in which state the plants present a very weedy appearance, the flowers being but little more than half the size of those produced on well-grown stocky plants.

ANNUALS.—Sowings of Amaranthus, Balsams, Cockscombs, Globe Amaranth, Marigolds, Toreniyas, Zinnias, &c., may be made early in the month but to grow them successfully the seed pans must be placed in a cool shady position till the seed germinates.

JULY

THE VEGETABLE GARDEN.

The only work in this department is to continue to make sowings. at regular intervals, of Brinjals, Okra, Cucumbers, and the various kinds of runner Beans and Gourds.

Jerusalem Artichokes, Arrowroot, Turmeric, and Ginger, that were planted early, will now require to be earthed up

All vacant ground should now be turned over, leaving the surface as rough as possible. The oftener this operation is performed during the next three months the better condition will the ground be in, for planting in October.

THE FLOWER GARDEN.

PLANTING.—Where any alterations in grounds or gardens are contemplated, the present is the most suitable time for making them. In selecting trees and shrubs it is necessary to take into consideration their habit of growth and the form they are likely to assume when they are fully developed, and whether they will be of an upright and drooping habit, or of a round-headed or pyramidal form, &c., and with a view to secure the desired effect in grouping or arrangement, the hue and form of leaf should also have attention given them. There is also another very important point which should not be lost sight of, *riz.*, that of selecting plants that are likely to thrive in the soil and situation where it is intended they should be planted.

CHRYSANTHEMUMS will require attention. The earliest plants that were propagated in January will now be ready for their blooming pots: those struck later in the season should be shifted on as they require it. Every encouragement should be given to promote vigorous growth, as the secret of success is to get them well established and the growth thoroughly matured, which cannot be done if they are left to make it later in the season. Although of a gross feeding nature, it is not (at this season especially) advisable to use a very rich soil, good fibry loam with the addition of one-fourth or one-sixth of very old cowdung being the best and most suitable, as what stimulants they require can be given later in a liquid form when making and developing the buds.

ROSES.—Where it is the practice to propagate these by budding the present is the most favorable season, as the bark, of *Rose Edouard*, which is generally employed as a stock, rises more freely now than at any other period of the year. Cuttings of *Rose Edouard*, China Roses, *Devoniensis* and many varieties of Tea Roses will now strike freely.

ANNUALS.—Seedlings of Zinnias, Balsams, Cockscombs, Amaranthus, &c., should now be ready for planting out. They do best on well raised

beds at this season, for although they will all thrive in, and in fact require an inordinate amount of moisture, still anything like a stagnant, water-logged soil is fatal to their well-being.

AUGUST

THE VEGETABLE GARDEN.

Little can be done during this month in the vegetable garden, the soil being generally too moist to work readily. Take advantage however of any weather and have all vacant ground dug over to a depth of about six inches turning all your crop of weeds completely underneath. Do not attempt to rake or level the soil again, the rougher the surface presented to the action of the air the better.

In the North-West Provinces and Upper Bengal small sowings of the early varieties of Cauliflower may now be made in pots or pans under shelter.

CELERY.—The first sowing of Celery should be made at once in boxes in the coolest sheltered position available ; the seed will take a long time to germinate at this season, frequently six weeks or more, but will produce stronger and hardier plants than from sowings made later in the season when the seeds germinate quickly.

ASPARAGUS.—Where new beds are required, seed may now be sown thinly in boxes ; these will make strong healthy plants for planting out immediately after the rains. I prefer however to wait till September and sow the seed at once in the beds intended for them. By this method the plants experience no check, are consequently more vigorous, and produce an earlier crop than when they are transplanted.

TOMATOES.—Seeds of the small acclimatised variety may now be sown.

THE FLOWER GARDEN.

No time should now be lost in putting in cuttings of Ornamental Foliage Plants such as Crotons, Aralias, Panax, Eranthemums, Acalypha, etc. ; they not only root more quickly now than at any other season, but there is also the additional advantage that they will have sufficient time to make strong healthy plants before the cold season sets in : cuttings of flowering shrubs, such as Ixoras, Hibiscus and Gardenias will also strike readily. Climbing plants, including the Bignonias, Antigonons and Bougainvilles, may now be layered successfully. Stephanotis floribunda, Cissus discolor and the Allamandas will all strike readily from cuttings placed in sand under glass.

Advantage should be taken of fine weather to store up a supply of good loam, leaf mould, old manure, and coarse sand under shelter, mixing them in their proper proportions as soon as they are sufficiently dry, in readiness for the first sowing of annuals to be made early in September.

SEPTEMBER

THE VEGETABLE GARDEN.

I can only speak in general terms of the work which may be advantageously done now, preparatory to the active season which approaches. The thoughtful reader will study out the subject for himself and leave nothing undone which may expedite the varied and important labours which must be taken in hand next month. It must be borne in mind that directions for sowing seeds must be taken rather as reminders of what may perhaps be done with safety than as absolute rules. Each one must use his own judgment, it being evident that in our changeable climate, seed which may be sown with comparative safety at a given period one season, it would be folly to sow at the same period another season. We must each for ourselves observe the temperature of the atmosphere and condition of the soil and act

accordingly. Dig or trench all vacant ground; if the soil is sufficiently friable, a heavy dressing of manure should be given on those portions on which we intend to plant our gross feeding crops, such as the Cabbage, Cauliflower or Celery. The advantage in applying manure sometime before the ground is required, is that it has time to become thoroughly incorporated with the soil and is consequently then in a much better condition to afford strength and nourishment to the intended crops, than it is when newly applied.

Sowings of Cabbages, Cauliflowers, Khol Kohl and Artichoke should now be made either in pots or on a raised bed protected from heavy rains. As soon as the seedlings are large enough to handle, they should be transplanted into other beds, placing them three to four inches apart.

Second sowings of Cabbages, Brussels Sprouts, Cauliflowers, Savoys and Khol Kohl should be made before the end of the month. As soon as the weather clears up, the first sowings of Turnips, Lettuces, Beet and Carrots should be made in raised beds. Sowing so early is of course attended with a considerable degree of uncertainty, as if heavy rains again ensue, the seed is inevitably lost, but still the experiment is worth the risk, as provided the weather continues fine, we shall by this means be almost a month in advance of our friends who are not so venturesome.

THE FLOWER GARDEN.

Sowings of Asters, Pansies, Cinerarias, Primulas, Verbenas, Dahlias and Balsams may be made, keeping them carefully protected from heavy rains; as soon, however, as they are above ground they should be exposed fully to the air whenever the weather is fine, otherwise they become weak and drawn, and probably damp off.

Cuttings of Crotons, Panax and other foliage plants may still be made; old plants, however, should not be cut too severely now as they will not have sufficient time to make new growth before the cold season sets in, when they remain almost stationary.

Pot plants should be carefully looked over: perform whatever pruning may be required and re-pot all those that need shifting. They will then have time to get a firm hold of the new soil before the end of the rains, and will be better able to withstand the many vicissitudes attendant on artificial watering that pot plants have to encounter all through the cold and hot seasons.

CHRYSANTHEMUMS.—Chrysanthemums should have their final staking and tying. The ordinary upright bush fashion is the best for general purposes, using as many stakes as will be necessary to keep the plants in form. Where good blooms are wanted all the small lateral side branches should be removed from the principal shoots, retaining the latter in numbers proportionate to the size of flowers required.

OCTOBER

THE VEGETABLE GARDEN.

Continue the work mentioned for last month; prick out all seedlings of Cauliflowers, Cabbages, Brussels Sprouts, Celery, etc., as soon as they are large enough to handle.

As soon as the weather is fine, and the soil in a fit state for working, the first sowings of Peas and Beans should be made.

Small sowings of Turnips, Carrots, Endive, Cress, Lettuces, Beet, Radishes and Mustard, Onions and Leeks should now be made, selecting the driest and most elevated portion of the garden, as in the event of any heavy rains occurring they will then have a better chance of withstanding its effects.

Ground for Cabbages, Cauliflowers, and the other members of this tribe, should be got ready, but it is not advisable to transplant seedlings before

the middle of the month, unless the weather is exceptionally fine and plants also plentiful ; in such cases it is worth while venturing a little in the hope of securing an early crop.

THE FLOWER GARDEN.

We have now arrived at the most important period of the whole year for the Gardener in the plains, as it is mainly on the work of the next month that the success or failure of the season's operations depend. As soon, therefore, as we can rely on the weather being settled, we should lose no time in making our preparations for commencing the ensuing campaign.

It is now time to sow most kinds of annuals, and especially those intended to be used in the general bedding arrangements. The immense number of new species that have been introduced have pushed to the rear many good old kinds of the annuals that twenty years ago did excellent service for our predecessors, and to this hankering after novelties, may be attributed the vast numbers of the failures we so frequently hear of in the cultivation of this desirable group of plants. For in this, as in more important matters, we too often overlook the virtues of an old friend—"tried and true"—in our admiration for the more fascinating, though perhaps fleeting qualifications, of a stranger. Not that I would condemn all the more recently introduced families of annuals—on the country, there are many of them strikingly beautiful, and which will thrive most satisfactory amongst us ; but still, to the inexperienced amateur, I would certainly say, be content with what has already been tested and proved in this country, for new varieties of seeds, as with new species of plants, should always be approached with caution, and it is better to await the result of trials by some more practised hand before venturing to have anything to do with them.

Mignonette, Sweet Peas, Candytuft, Bartonia, Clarkias, Poppy, Portulaca, Lobelia, Lupins, Nasturtiums and other hardy annuals may be sown as soon the soil is in good order. These will germinate much more quickly, and also more certainly, if covered with a mat or some other shading till the plants are well above the ground, but after this, the more they are exposed the more robust will be their growth.

The first sowings of Asters, Pansies, Cinerarias and Verbenas should now be large enough for pricking out, this may be done either into other seed pans, placing them about three inches apart, or into small pots ; I prefer the latter system, as the next shift can then be made without much injury to the roots.

Phlox Drummondi, Dianthus, Antirrhinum and other annuals, the seed of which were sown at the end of last month in pans, will also soon be ready for pricking out into pots or other pans ; use light rich soil, and as soon as the seedlings are well established give occasional doses of weak liquid manure to stimulate their growth, where, however, the plants have come up very thinly in the pans they need not be transplanted, but should be allowed to remain till large enough to place out in the open ground.

Hybrid Perpetual Roses that are required to bloom early may now be pruned ; it is better, however, to let the general stock remain till the end of the month. When we have a late rainy season the longer pruning is delayed the better ripened the wood will be, and, as a natural consequence, the plants will break more regularly and flower more freely.

Chrysanthemums should now be in their blooming pots and growing vigorously ; they should be kept in an open part of the garden where they are fully exposed to sunshine. As this plant is a very gross feeder, it not only requires a richer compost to grow in than most other plants, but must also be liberally supplied with stimulating food. Water should be sparingly applied to the roots till the pots are well filled with roots, and then it is not easy to over water them. The plants are very liable to attacks of thrip and green fly ; these pests can be destroyed by dipping the leaves in soft soap water to which some tobacco liquor has been added.

Hyacinths, Oxalis, Ixias, Narcissus and other imported bulbs should now be planted.

NOVEMBER

THE VEGETABLE GARDEN.

This department now demands a very large amount of attention, and every exertion should be made to get the work completed as soon as possible. By this I do not mean that every inch of ground should be cropped at once, a practice that is very frequently adopted by the inexperienced, by which means the whole crop of certain vegetables is ready for use at the same time. One of the chief points in successful vegetable growing is to have each species in season for as long a period as possible, and this can only be secured by sowing at intervals. We should therefore make our calculations so as to secure a constant succession of the various products as they are required, but leaving little or nothing to run to waste.

CAULIFLOWERS.—Cabbages, and the whole Brassica family, should be planted out without delay, choosing an open situation and well manured ground; supply the plants freely with water till established.

CELERY.—Should also be planted out as soon as the first batch of seedlings are large enough. Do not wait till the plants are very large, as small, sturdy plants take more readily to the soil and become established much quicker than those of larger growth.

PEAS.—Sowings of these should be made at intervals of a week or ten days. Sowings should be made either in double rows or in broad drills of not less than six inches in width. They should be scattered evenly at regular distances apart, so that there may be no crowding. They should be earthed up when about three or four inches high. Do not put sticks to them till they actually require it, as they are likely to draw them up weak, especially if sown too thickly. In sticking peas plenty of small twigs should be placed near the ground in order to conduct the stems upwards. It is useless to give them support above and leave them without the means of getting to it.

LETTUCES.—Sowings of these should be made at short intervals. When large enough put them out to a distance of about a foot apart, and transplant those removed into a bed of good rich soil, shading carefully for three or four days till established.

CABBAGES.—Cauliflowers and the members of the Brassica tribe should be carefully looked over to see if any are eaten by vermin. Replace all the plants that have been destroyed and draw earth up to the stems. As the plants increase in growth a dusting of lime given early in the morning, when the plants and soil are wet with dew, will destroy slugs.

CARROTS.—The long varieties of these may now be sown. Sow in drills twelve inches apart, thinning out the plants to a distance of six inches as soon as large enough. The following is a very good method of growing very large carrots. Make a very deep hole with a long dibble, ram the earth well down all round it when the dibble is in, and when it is removed fill up the hole with fine rich soil; sow a few seeds on the top, and when up draw out all except the strongest plant nearest to the centre of the hole. Prodigious carrots may be produced by this means.

GLOBE ARTICHOKES.—The young seedlings of these should now be ready for planting out. Where any old plants have survived through the rainy season, the offsets or side shoots may now be removed and planted out in rich soil. These frequently produce the earliest crops.

Make occasional sowings of French Beans, Spinach, Endive, Cress, Mustard, Beet, Onion, Turnips, etc. The second crop of Cauliflowers, Cabbages, Savoys, Brussels Sprouts and Khol Kohl should be planted out as soon as the plants are sufficiently advanced. In lifting seedlings care should

be taken to have a good sized ball of earth attached to each, and water must be liberally supplied till they are well established. The less check that plants receive in transplanting the better and earlier the crop will be.

Small sowings of Cauliflower and Cabbage may still be made for a late crop.

THE FLOWER GARDEN.

TUBEROUS BEGONIAS AND GLOXINIAS.—If not already started, the old bulbs of these should at once be set to work, repotting them in good fresh soil, and giving root room in proportion to the size of the bulbs; for though they may be considerably assisted by liquid stimulants, yet with free growing subjects like the former, that make large heads in a little time, a good amount of space is requisite for the roots: if too much confined, the amount of growth and flowers forthcoming will be limited.

Continue the pruning of Roses where the work has not already been completed: wait till the wounds are properly healed, and then open out the roots of the plants by removing the soil to a depth of about eighteen inches and the same distance all round the plants; let the roots remain fully exposed to the atmosphere for at least a fortnight; this insures a thorough ripening of the wood, without which we cannot expect a liberal display of bloom. It is a strange fact that this operation, which has been generally practised in this country for at least a quarter of a century, has only within the past few years been adopted in England, and is there termed "Mentonising Roses" probably from the system having been previously employed there. After having exposed the roots for the time stated, give the plants a good dressing of manure, very old cow manure and horse manure mixed in equal proportions is the best, and when applying it, it should be thoroughly forked into the soil, and not allowed to remain in a ring round the collar of the plants as is frequently done.

The Seeds of Mignonette, Candytuft, and other annuals, if not already sown, should be got in at once as recommended last month. Larkspurs and Nemophila may also now be sown, but the seed will rarely germinate before the cold weather sets in.

The seedlings of Phlox Drummondii, Dianthus, Antirrhinums, and other annuals that have been raised in pans should now be ready for planting out. To grow annuals successfully, great care is required in the proper preparation of the beds. If we have naturally a good light soil, a liberal dressing of leaf mould and old cow manure will be sufficient; if, however, it is of a heavy retentive nature, we should remove it to a depth of at least eighteen inches, replacing it by a compost of two parts good light fibrous loam, one part leaf mould, and one part cow manure. The manure and leaf mould used in growing annuals should be at least two to three years old, as, unless it is thoroughly decomposed, it invariably does more harm than good.

ANNUALS.—The planting out of Asters, Stocks, Dianthus, Antirrhinums and other annuals should not be longer delayed. When they are to be planted in beds or masses for cutting, the best way of doing it is to plant in drills; they are then more readily and effectively watered, a procedure necessary until they are well established in the new soil, after which, the drills being filled in, the plants have so deep a hold of the soil that staking is rarely necessary. Thin out Mignonette and other Annuals that have been sown where they are to flower.

DECEMBER

THE VEGETABLE GARDEN.

BEET.—Thin the main crop before the plants get so large as to interfere with their growth, 9 inches apart in the rows will generally be sufficient, but for the more vigorous growing kinds 12 inches may be allowed.

ENDIVE.—Transplant Endive when large enough 15 inches apart every way, maintaining successional supplies of this, also of Lettuces, Radishes, and Turnips by occasional sowings, and to insure crops of fine quality they must be regularly supplied with water in dry weather.

CARROTS.—Advancing crops of Carrots should be again looked over to see that they are not left too thick, especially the main sowing. Turnips also will require attention in this respect. There are few crops that suffer so much as this if allowed to stand too close together, as when in this state they run to leaf, forming bulbs that are not only small, but very inferior in quality.

LETTUCES.—Plant out Lettuces as soon as they are large enough to handle; if they are removed to the place where they are to be grown when the leaves are about $1\frac{1}{2}$ inches long they suffer much less than if allowed to get much larger before removal. Upon this in a great measure, depends their ability to stand long without running to seed. Much also depends on their receiving plenty of water until they have taken firm hold of the soil.

ONIONS.—Required to be very large may now be provided with a deep well-manured bed in a rather dry position. Transplant into this bed, putting the bulbs nine inches apart: if only serviceable bulbs be required, put them six inches apart. After planting, strew wood ashes or fine siftings of charred rubbish over the bed.

PARSNIPS.—Should at once receive all the thinning they will need. Spinach ought to be thinned as soon as it is large enough to handle. This vegetable is often neglected by not receiving sufficient room, in which case the produce does not approach in quality to that which it attains when each plant is allowed to stand 6 in. or 8 in. apart in the rows; so treated the leaves will be three times the size and substance of a crowded crop.

PEAS AND BEANS.—Continue to make successional sowings of these at intervals of ten days or a fortnight, the earlier crops should now be ready for staking; this operation should not be delayed too long, otherwise the crop is very liable to be injured.

ADVANCING CROPS.—When the ground is dry on the surface any that has been cropped for some time should be hoed over as soon as there is any appearance of weeds; by thus disturbing them directly they vegetate, much less labour is involved in their destruction than if they be permitted to attain a considerable size. Use the implement freely, so as to stir the ground 2 in. or 3 in. deep, leaving the top as loose and open as possible, which will assist the growth of the crops.

THE FLOWER GARDEN.

ANNUALS.—Thin out seedlings of these that were sown in the open, guard them from slugs by dustings of fresh lime, or by laying down small patches of bran, which the slugs soon find out, and late at night or early in the morning they may be caught purloining the same. Prick out all advancing seedlings of Pansies, Asters, Wallflowers, Stocks, Everlastings, Sweet Williams, &c. It is a very common occurrence to see the seedlings left in the seed pans or seed beds until they are so weakened by overcrowding as to be of little value.

The present is a good time for making a second sowing of most of the free growing varieties, notably Mignonette, Candytuft, Sweet Peas, Poppies, Nemophilas, Larkspurs, Love-lies-bleeding, and others. The soil should have previously been well worked and the seed be sown thinly in patches where the plants are required to flower.

Complete the planting out of Phlox Drummondii, Dianthus, Antirrhinums and other plants intended for beds or borders, and as soon as well established a liberal allowance of weak liquid manure should be applied at intervals of a week or ten days; this will promote a vigorous, healthy growth and an abundance of bloom.

Monthly Operations for the Hills.



JANUARY

VEGETABLE GARDEN.

But little work can be done in this department during the present month, during fine weather sowings of the smaller varieties of Carrots may be made, the seeds will probably lay dormant in the soil till after the first heavy fall of snow when they will germinate freely.

THE FLOWER GARDEN.

BULBS.—Of all kinds that were potted early and plunged in ashes or cocoanut refuse, as previously recommended, with a covering of the same material overhead, will by this time have made considerable growth; they must not be allowed to remain in such a position so long as to cause the foliage to become drawn up too much.

CINERARIAS AND PRIMULAS sown some time ago, should, as they are large enough to handle, be transferred to small pots, or they can be put 1½ in. apart into large pans in fine soil made rich and loose by the addition of sifted leaf-mould and a little sand, remaining there only so long as they do not become over-crowded, after which insert them singly in 3-in. pots.

PETUNIAS.—These plants do not generally receive the attention they deserve, a bed of Petunias is both beautiful and interesting, especially if the colours be well intermixed; a packet of seed of any good strain will afford a vast amount of variety. A bed of the double kinds, when the plants make good growth, is strikingly effective, the colours being soft, delicate and harmonious. These should be sown by the end of the month in boxes or pans under glass.

FEBRUARY

THE VEGETABLE GARDEN.

BEET.—A little Beet may now be sown for an early supply, but do not yet sow the principal crop, as it is liable to run to seed if sown too early. Sow in ridges 12 to 15 inches apart; where the soil is shallow it may be drawn into ridges about six inches high and on these sow the seed, four or six together, in small holes 12 inches apart, covering them not more than half an inch deep.

ENDIVE.—Where Endive is required early, a little of the green curled variety may now be sown, but as this early sown crop is also liable to run to seed, it is not well to have too much of it.

BRASSICA AND CAULIFLOWERS.—Another sowing of Broccoli should now be made, also one of Cauliflower; any of the Erfurt varieties are good, also Veitch's Autumn Giant.

TURNIPS.—These may now be sown, and for the general crop none are better than the Red-topped American Stone or Chirk Castle (black top).

As with most other vegetables, it is much the best practice to grow Turnips in rows. Sowing in this way takes a little more time, but any loss is saved many times over by the facilities given for the use of the hoe in place of hand weeding, which must, in a great measure, be resorted to where crops are sown broadcast. Continue to make sowings of Carrots at intervals, a little Lettuce may also be sown under glass to plant out next month.

THE FLOWER GARDEN.

ASTERS, STOCKS, PANSIES, ANTIRRHINUMS, PHLOX DRUMMONDI, DAISIES, PETUNIAS and other species requiring a long period to perfect their growth may be sown at once in pans or boxes under shelter. The soil for the seed pans should be moderately rich and fine. Good loam improved by the addition of thoroughly decayed manure and leaf mould, with sufficient sand to render the texture porous, will suit almost all kinds of Annuals grown in this way. Sow the seeds thinly and cover very lightly, and to insure a uniform degree of moisture without the necessity of watering, it is advisable to lay a square of glass over each pot; should watering become necessary, take care to avoid washing the seeds out. If the pans or pots containing the seeds are placed for an hour or two in a vessel containing two or three inches of water they will absorb sufficient, and there will be no necessity to pour water on the surface. As soon as the young plants appear, remove the glasses and place the seed pans in the fullest light where air can be given without danger to them. Choice varieties should be pricked out into pots or pans as soon as large enough; this will promote a robust stocky growth and encourage a free development of flowers. Take care not to plant out until the weather is favourable, otherwise these tender nurslings will damp off at once.

CHINESE PRIMULAS.—The earliest plants are now in full bloom, and require to be kept in a house rather warmer than a cool greenhouse. In cold damp weather many of the plants will go off at the neck unless the house is warmed a little.

HERBACEOUS CALCEOLARIAS.—If it is intended to propagate a stock of any of these from cuttings, it will be found that they form roots very readily if they are put in at this time. The plants produced from seeds sown early should now be potted on into their flowering pots, using good loam, leaf-mould, and rotten manure, as the Calceolaria likes rich soil. Eight-inch and 9-inch pots are the best for large specimens. Later plants must be potted on as they require it, handling the plants carefully, as the roots and leaves are easily injured. Use a liberal proportion of sand in the compost for small plants.

CINERARIAS.—The early flowering plants have been potted into their blooming pots. Those raised from later sown seeds will be potted on as they require it. There are no special instructions required at present. Fumigate for thrips and greenfly; dust the leaves with flowers of sulphur on the first appearance of mildew.

MARCH

THE VEGETABLE GARDEN.

PEAS.—Sowing of these should now be made, selecting dwarf varieties as "William I.", "Little Gem," or "Blue Peter." These should be followed

after an interval of a few days by later growing kinds, such as "Advancer," "Supreme," "Telephone," or "Telegraph," four or even five feet between the rows is not too much, for the latter varieties, and a row of Cauliflowers or Cabbages may be grown between. Peas should always be sown in rows running from North to South, as all the plants are then equally exposed to sunlight.

ONIONS.—The first favourable opportunity of sowing seeds of this vegetable should be taken. Choose a good open situation, heavily manured and deeply dug. Do not attempt to sow if the ground is at all wet, as a firm soil is requisite if well formed and solid onions are wished for, and the trampling necessary is very detrimental unless the soil is tolerably dry. Previous to sowing, a dressing of either soot or wood ashes, or some of both, and also a slight sprinkling of salt may be stirred but not turned in with a fork. Sow the seed in shallow drills about nine inches apart.

A first sowing of Dwarf French or Kidney Beans should now be made. Negro or Canadian Wonder are good varieties. Broad Beans should also be sown. Sow Lettuce seed every fortnight, so as to secure a regular succession. Radish seed likewise must be sown frequently to secure a regular supply. Basil, Sweet Majoram, Thyme, Sage, Savory and other herbs should now be sown.

The principal crops of Turnips, Carrots, Beet, etc. should be got in as soon as possible.

THE FLOWER GARDEN.

The first sowings of Asters, Pansies, and Verbenas should now be large enough for pricking out; this may be done either into other seed pans, placing them about three inches apart, or into small pots; I prefer the latter system, as the next shift can then be made without much injury to the roots.

Sowings of annuals, such as Mignonette, Antirrhinum, Phlox Drummondii, Poppy, Dianthus, Helichrysum, etc., may now be made in pans under shelter; preparations also should be made for sowing them in the open ground early next month.

APRIL

THE VEGETABLE GARDEN.

PEAS—About two more sowings of these will in most instances be found sufficient, those sown still later being quite chance crops. Main and late crop varieties are most suitable, notably Yorkshire Hero, Veitch's Perfection, Blue Scimitar and Premier, and of tall varieties, Emperor of the Marrows and Champion of England. Late Peas should have a ridge of soil drawn on each side of the row, and within two inches of it so as to confine the water, which should be applied without stint, or it will be impossible to keep them from becoming a prey to mildew. One good drenching, so as to moisten the soil down as deeply as the roots descend, will be of more service than half a dozen partial applications.

CAULIFLOWERS—Cabbages, and the whole Brassica family should be planted out without delay, choosing an open situation and well manured ground, supply the plants freely with water till established.

Plant beds of Globe Artichokes in soil well trenched and manured, also of Jerusalem Artichokes; they like freshly broken up ground.

Tomatoes sown last month should now be ready for transplanting; these require a light, rich soil, and a partially shaded situation suits them best.

PARSLEY.—A little Parsley should now be sown on well-prepared rich ground; sow in drills 15 inches apart. This will not be disposed to run to seed nearly so quickly as when plants are raised in pans or seed beds and afterwards transplanted. Thin out the plants as soon as large enough

leaving them 9 or 10 inches apart. If this is attended to in time there will be little to fear from canker at the root which usually occurs when the plants are over-crowded.

TURNIPS.—Of these more should now be sown, and means be taken to preserve the plants when they germinate, from being destroyed by birds and the ravages of the Turnip fly. Slight and repeated sprinklings of soot early in the morning, whilst the dew is on the plants, I have found the most effectual means of saving Turnips from these pests.

LETTUCE, ENDIVE, &c.—Sow more Lettuce of both Cos and Cabbage kinds, as also Radishes, Mustard and Cress; where these latter are continually required, a little of the Green Curled Endive should also be put in.

LIQUID MANURE.—Given to Peas, French Beans, Lettuce, Cabbage, Cauliflowers or anything of a similar nature before they have more than half arrived at maturity helps in increasing the quantity of produce to a much greater extent than if applied when growth has further advanced, although there is no question that even when thus given in the latter stages it assists development.

THE FLOWER GARDEN.

TUBEROUS BEGONIAS AND GLOXINIAS.—If not already started, the old bulbs of these should at once be set to work, repotting them in good fresh soil, and giving root room in proportion to the size of the bulbs; for though they may be considerably assisted by liquid stimulants, yet with free growing subjects like the former, that make large heads in little time, a good amount of space is requisite at the roots: if too much confined the amount of growth and flowers forthcoming will be limited.

DAHLIAS.—The plants must now be planted out if this has not already been done. The plan of putting the permanent sticks first at the place where the Dahlia is to be planted is the best one, and the plants must be fastened to the sticks as soon as possible after they are put out. Best results follow the retention of a single stem only to each clump. The Dahlia revels in well-cultivated and rich soil, and can only be induced to produce fine blooms under these conditions; therefore the plot set apart for the culture of these flowers should be deeply trenched, working in at the same time a liberal quantity of manure. A very good dressing is old cow manure broken up finely when in a semi-dry state, mixed with an equal quantity of horse droppings.

It is now time to sow most kinds of annuals, and especially those intended to be used in the general bedding arrangements. The immense number of new species that have been introduced have pushed to the rear many good old kinds of the annuals that twenty years ago did excellent service for our predecessors, and to this hankering after novelties, may be attributed the vast number of failures we so frequently hear of in the cultivation of this desirable group of plants. For in this, as in more important matters, we too often overlook the virtues of an old friend "tried and true" in our admiration for the more fascinating, though perhaps fleeting qualifications, of a stranger. Not that I would condemn all the more recently introduced families of annuals, on the contrary, there are many of them strikingly beautiful, and which will thrive most satisfactorily amongst us, but still, to the inexperienced amateur, I would certainly say be content with what has already been tested and proved in the country, for new varieties of seeds as with new species of plants should always be approached with caution, and it is better to await the result of trials by some more practised hand before venturing to have anything to do with them.

Mignonette, Sweet Peas, Candytuft, Bartonia, Clarkias, Poppy, Portulaca, Lobelia, Lupins, Nasturtiums and other hardy annuals may be sown as soon as the soil is in good order. These will germinate much more quickly and also more certainly if covered with a mat or some other shading till the

plants are well above the ground, but after this the more they are exposed the more robust will be their growth.

The first sowings of *Asters*, *Pansies*, *Verbenas*, *Cinerarias*, etc., should now be pricked out if not already done, as recommended in our last.

Phlox Drummondii, *Dianthus*, *Antirrhinum* and other annuals, the seeds of which were sown at the end of last month in pans, will also soon be ready for pricking out into pots or other pans; use light rich soil, and as soon as the seedlings are well established give occasional doses of weak liquid manure to stimulate their growth, where, however, the plants have come up very thinly in the pans they need not be transplanted, but should be allowed to remain till large enough to place out in the open ground.

MAY

THE VEGETABLE GARDEN.

SOWING LETTUCE.—Make successional sowings of *Lettuce*, and at this season it is a good practice to draw shallow drills 12 in. or 15 in. apart, and to sow the seeds in the bottom; the plants can thus be well soaked with water when they require it; advancing crops will be benefitted by the application of manure water. Early crops of the *Cos* varieties should, as they approach maturity, be tied up with bast, which is of much assistance even in kinds that are the most disposed to turn in their leaves and blanch naturally, and, moreover, it improves the quality. Amateurs who have not had much experience in *Lettuce* growing are apt to tie the ligatures too tight, which bruises the leaves and causes them to rot. All that is required is to draw the leaves together with the hand and tie them sufficiently close to exclude light.

RADISHES.—Of these a sowing should now be made every fortnight; those sown now will be of much better quality than such as were raised earlier. Where *Mustard* and *Cress* are required these should be sown every ten days. These with *Radishes* and *Lettuce* must, to have them fit to eat, be regularly well watered, without which it is impossible to have salad of good quality. The chief reason why the productions of the French *Salad* growers are renowned as being superior to all others is that they are continuously supplied with copious applications of manure water so as never to allow the crop, from the day the seed vegetates until it is gathered, to want moisture.

CELERY.—More *Celery* should now be pricked out in beds of prepared soil; give plenty of water to that pricked out some weeks ago. This vegetable is almost an aquatic, and on no account should it ever be allowed to get dry at the root, for such a condition not only stunts the growth, but if the variety happen to be such as is disposed to run prematurely to seed, a deficiency of water in the early stages of growth is calculated to aggravate the evil.

THE FLOWER GARDEN.

Make successional sowings of *Mignonette*, *Candytuft*, *Nasturtium* and other fast growing subjects.

Complete the planting out of *Phlox Drummondii*, *Dianthus*, *Antirrhinums* and other plants intended for beds or borders, and as soon as well established a liberal allowance of weak liquid manure should be applied at intervals of a week or ten days; this will promote a vigorous, healthy growth and an abundance of bloom.

Chrysanthemums should now be liberally supplied with manure water, or else have a stimulant such as soot, guano, or some artificial manure applied to the surface of the soil so that it may be washed down to the roots.

DAHLIAS AND HOLLYHOCKS.—As Dahlias advance in growth, see that they are kept regularly tied up. They should have three or four sticks to each plant, so as to keep them open and allow the sun and air to get to the centres. The practice of tying these plants up to a single stick is bad and unsightly; it causes them to run up tall, and affords little security against strong winds. To induce the plants to throw out strong side-shoots, pinch out the points of the leading growths. See that they are quite free from aphides, and, if any are detected, syringe with tobacco water. Hollyhocks must be well secured to stout sticks as they increase in size, for if they get blown over it spoils them. They do not require the sticks so long as those sometimes used, unless grown in very exposed places, in which they should not be planted. If the sticks are 4 ft. out of the ground after being firmly driven down, they are high enough. Do not tie them so tightly as not to allow sufficient room for the stems to thicken. On the other hand, they must not be left so loose as to chafe with the wind against the supports.

JUNE

THE VEGETABLE GARDEN.

SOWING SEEDS.—Although the principal part of the work of seed sowing is now accomplished, sowings will still have to be made of such vegetables as Turnips, Lettuces and Salading, and in some instances of Peas and Beans. Where the soil is very dry the watering-pot will have to be brought into use. If the ground be hard and unworkable, water it evenly and freely the evening previous to sowing, and where the soil is light draw the drills and well water them a few hours previous to sowing the seed; this will be found a better practice than watering after the seeds are sown and the soil levelled, because the moisture enclosed by the dry soil does not evaporate so quickly, neither is the surface so liable to cake.

THE FLOWER GARDEN.

CHRYSANTHEMUMS—Will now require attention. The earliest plants that were propagated in January will now be ready for their blooming pots: those struck later in the season should be shifted on as they require it. Every encouragement should be given to promote vigorous growth, as the secret of success is to get them well established and the growth thoroughly matured, which cannot be done if they are left to make it later in the season.

HOLLYHOCKS.—The plants will now be in full growth, and must be encouraged by watering freely if it is required. As soon as the side growths are strong enough to give eyes for cuttings, they must be taken off, and the eyes should be used to produce plants. Cut them out and plant them in the same way as Vine eyes are done. Fine sandy soil should be used for this purpose. I prefer to put one eye in the centre of a thumbpot.

JULY

THE VEGETABLE GARDEN.

BEANS.—Runner Beans may yet be sown; the earliest sown being staked before they are much advanced in growth, employing strong stakes if procurable, and mulch with short stable litter or grass so as to maintain a uniform moisture. Similar remarks apply to French or Dwarf Kidney Beans. Supply early Cauliflowers with liquid manure, and mulch with partially decayed manure,

CELERY.—Continue to plant out Celery as fast as the plants are ready, doing so preferably in single rows, affording a plentiful supply of well-

decomposed manure dug-in in a moist state, leaving about 4 inches of soil on the surface.

A small sowing of Lettuces may be made under shelter, as soon as they have made three or four leaves, these should be planted out.

THE FLOWER GARDEN.

Chrysanthemums should now be in their blooming pots and growing vigorously, they should be kept in an open part of the garden where they are fully exposed to sunshine. As this plant is a very gross feeder, it not only requires a richer compost to grow in than most other plants, but must also be liberally supplied with stimulating food. Water should be sparingly applied till the pots are well filled with roots; and then it is not easy to over water them. The plants are very liable to attacks of thrip and green fly; these pests can be destroyed by dipping the leaves; in soft soap water to which some tobacco liquor has been added.

Cuttings of Geraminus, Fuchias and Hydrangeas will now strike freely under glass.

AUGUST

THE VEGETABLE GARDEN.

But little can be done at this season in the vegetable garden, towards the end of the month a sowing of one of the earliest varieties of Peas may be made, these, provided we have sufficient sun to insure their germinating will come into bearing in October.

THE FLOWER GARDEN.

RICHARDIA ETHIOPICA is a most valuable subject as a decorative plant for winter, viewed either as regards its foliage or the numerous highly ornamental flowers it sends up. No place should be without a good stock of these, and now is a good time to divide and increase them, as each stem or crown will afford a separate plant. Secure with each piece as many roots as possible, and pot separately in light rich soil, after which place them where they can receive a moderate amount of heat for the purpose of giving them a start for their future planting-out. Plants already established may be turned out at once so as to give them a long season's growth, by which they will produce a continuous supply of flowers all through the winter.

Roses may now be budded, and cuttings of the tea varieties will now strike freely if kept close under glass.

SEPTEMBER

THE VEGETABLE GARDEN.

PEAS.—When the state of the soil admits, a sowing of early Peas should be made. Little Gem, Blue Peter, First and Best, Carter's First Crop, Sutton's Emerald Gem, Landreth's first Early and American Wonder are all good varieties. Peas are almost universally a favorite crop, and some extra attention is necessary to have them in season as long as possible. The earlier sowings should be considerably thicker than late tall growing kinds.

CABBAGES.—If not already done, the late varieties of Cabbages, Savoys, &c., should now be sown. Prick out the plants from the later sowings in rich soil, keeping them shaded until established, and the soil always moist. Sowings of Spinach, Radishes, and Lettuces should be made at fortnightly intervals, avoiding transplanting the latter, thinning early, and supplying

water abundantly in dry weather. Turnips also should be sown at similar intervals. Mustard and Cress will require to be sown not less than once a week, so as to have a supply always on hand.

THE FLOWER GARDEN.

LILIES.—The majority of the failures that take place in the cultivation of Lilies are traceable to potting at the wrong season, that is when the roots are in motion. For general usefulness none are superior to *L. auratum*, *L. speciosum*, and *L. eximium*; such of these species as require any disturbance at the roots, either to divide them where overcrowded, or for the removal of the small bulbs which the two latter kinds form so freely, should at once be attended to. I have found nothing suit these plants so well as good turfy loam with about one-fifth of leaf mould, a little rotten manure, and a good sprinkling of sand, keeping the bulbs well down in the pots, so as to permit most of the stem roots, which *L. speciosum* produces freely, being below the surface. With all these and other pot Lilies it is a matter of the first importance that the soil should be kept continuously until the shoot appear above ground in a medium condition for moisture; when the roots begin to move, if too dry, they cannot make progress, and if too wet they rot.

CHRYSANTHEMUMS.—Chrysanthemums will now be showing their flower-buds, which should at once be thinned out if large sized blooms be desired for exhibition or other purposes. During this necessary operation make choice of the strongest and most prominent buds, and only leave one to each shoot. With the pots well filled with roots, as they should be at the present time, plenty of liquid manure should be given, the gross feeding habits of Chrysanthemums rendering frequent application of this stimulant necessary to keep them in health and vigour, particularly at this stage of their growth when the the soil has become nearly exhausted. If the manure water be obtained from the drainage of the cow yard, or some similar place, it may be given almost at its full strength, but if made from soot, guano, or other hot manures, some discrimination in its use will be necessary.

No time should be lost in striking cuttings of Geraniums, Pelargoniums, Fuchsias &c., at this season they root readily within a few days, but if this operation is delayed too late the cuttings will frequently remain all winter without rooting at all.

Sowings of Cineraria, Primula and Calceolaria should be made early in the month, these if properly cared for will make strong vigorous plants before the winter sets in.

OCTOBER.

THE VEGETABLE GARDEN.

Sowings of Cabbages, Cauliflowers, Savoys and Brussels Sprouts may still be made for successional crops, and continue to prick out the seedlings as soon as they are large enough to handle.

PREPARING GROUND FOR CABBAGES, CAULIFLOWERS, BRUSSELS SPROUTS, &c.—Prepare the ground by digging it well and by giving it a good dressing of manure for planting with Cabbages, Cauliflowers, Brussels Sprouts, &c., as it is important to get these in as early as possible after the ending of the rains, and especially the Brussels Sprouts which become larger and the produce is proportionately greater—if planted early.

All refuse vegetable matter, whether living or dead, should be carefully treasured up, as it contains within itself the nucleus of future crops. There is such a number of substances usually called rubbish, such as the cleanings and trimmings of banks, roads, and hedges, also easily obtained as to render the improvement of even a bad soil not so difficult a matter as at

first sight it might appear. Amongst the most useful of mechanical agents for ameliorating a heavy soil may be mentioned all kinds of ashes and charred earth or clay, lime and mortar rubbish, and the *debris* from old buildings when taken down; whilst light sandy soil cannot have anything so beneficially applied to it for improving its staple as a good dressing of clay spread over the surface.

Towards the end of the month sowings of Peas of the main crop varieties should be made.

THE FLOWER GARDEN.

HYACINTHS.—These should now be potted. A few directions may be useful to those who have not had much to do with this class of plants. Six-inch or seven-inch pots are the most convenient and look the best. Ordinary loam, wherein is a moderate quantity of sand, leaf soil and rotten manure are the most suitable materials in which to grow them. Put at the bottom of the pots $\frac{1}{2}$ in. to 1 in. of broken crocks, on this place an inch of dry rotten manure and fill up with the compost to within $\frac{1}{2}$ in. of the rim, making the whole moderately firm; then take out of the centre as much of the soil as will allow three-fourths of the bulb going below the surface, pressing it firmly down on all sides. When all are potted place them in a cool dark godown or outhouse; arrange the pots as close as they will stand on a bed of two to three inches of coal ashes or cinders and cover them with about six inches of the same material, or where this is not available cocoanut fibre refuse answers equally well. They should be allowed to remain in this position until they have made a good quantity of roots and the crowns show signs of starting into growth.

CHRYSANTHEMUNS IN POTS.—Should now receive their final tying, using sticks enough to support the plants and keep them from being broken by the wind. As soon as the flowers are set, thin out the shoots. It is a mistake, even for ordinary decorative purposes, to allow the lateral flowering shoots to remain crowded, as the size of the blooms is thereby much reduced, and in texture they are so much thinner as not to last nearly the length of time they do when no more flowers are left on the plants than they can properly support.

ACHIMINES.—These should have every attention as they go out of bloom to assist them in forming and ripening their tubers. Achimines are too frequently stowed away directly they cease flowering or become shabby, and water entirely withheld from them, a course of treatment the reverse of what they require, as it is just at that time assistance is needed in rendering the drying off process natural. By affording them a little extra attention they will form an abundance of fine large tubers, superior in every way to any that can be obtained from plants left to take care of themselves.

CALADIUMS.—The earliest plants of these should now be permitted to go to rest by only giving them water occasionally at the roots. It is the practice of many to keep these growing through the winter, but it is not to be recommended, as they never start in the vigorous way which they do when dried off and allowed to go completely to rest.

NOVEMBER.

THE VEGETABLE GARDEN.

Sowings of late varieties of Peas may still be made, these will probably make but little progress during the winter, but on the first approach of spring will grow vigorously, and come into bearing much earlier than the sowings made at that period.

The late varieties of Cabbages Cauliflowers &c, should be planted before the end of this month, be careful to give them plenty of water till well established.

THE FLOWER GARDEN.

TUBEROUS BEGONIAS.—Entirely withhold water from these from the commencement of this month. Stand the pots in a position fully exposed to the sun, as soon as the stems have completely withered, remove the bulbs from the pots and store them in sand or saw dust in a dry place.

DAHLIAS will also now be going to rest, as soon as the stems are dry cut them off to within two inches of the soil, the bulbs may be allowed to remain in the soil, but it is advisable to cover them with about three or four inches of half rotted manure.

PELARGONIUMS.—See that the show varieties are potted into their flowering pots before the days are much shorter. After repotting them it is easy to make a blunder by giving too much water; they should have none for a week after, then give enough to thoroughly wet the whole mass of roots, and do not water again until the soil is dry. The leaves are not likely to be affected by spot if the plants are, where they ought to be, in a light airy position.

DECEMBER.

THE VEGETABLE GARDEN

In this month but little work can be done in the Vegetable Garden beyond careful watering of recently planted Crops during dry weather. Rhubarb and Sea kale will also require protection this is best afforded by covering each plant with about six inches of half rotted manure.

THE FLOWER GARDEN.

PETUNIAS AND VERBENAS.—The cuttings should now be rooted, and placed on shelves near the glass in a cool house to stand over the winter. If the plants are potted out thinly in 4 or 5-inch pots, in light soil, they will make healthy growth when the weather is fine. Keep the Verbenas free from mildew by dusting the leaves with flowers of sulphur where they are affected by it.

HYACINTHS, NARCISSUS and other bulbous plants that were put in at the end of October will now commence to grow freely, they should be removed into a frame or green-house and placed as near the glass as possible.

Geraniums, *Uchias* and other half hardy plants must now be placed under shelter, and shrubs, Roses and other plants in the borders should be well protected from frost.

Plants growing under glass will now require careful attention in the way of watering, with most subjects, except of course those that bloom at this season only just sufficient should be given to keep the foliage in a healthy condition.



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